

Theophrastus of Eresus

ON SWEAT, ON DIZZINESS AND ON FATIGUE



EDITED BY

WILLIAM W. FORTENBAUGH,

ROBERT W. SHARPLES

& MICHAEL G. SOLLENBERGER

THEOPHRASTUS OF ERESUS

ON SWEAT, ON DIZZINESS AND ON FATIGUE

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PUBLISHER'S NOTE

In 1979 Project Theophrastus was founded to collect, edit and translate the fragments of Theophrastus, Aristotle's pupil and successor as head of the Peripatos. The task was carried on by an international team of scholars based at various universities on both sides of the Atlantic. In 1992 the work was completed, and Brill published the product in two volumes. A reprint with corrections appeared in the following year. The texts contained in the two volumes are *testimonia* and verbatim quotations that are found in ancient and medieval sources. Theophrastean works that survive on their own in medieval manuscripts were not included. The omission was entirely sensible, for at the time there existed no collection of Theophrastean fragments that was either complete or edited in accordance with modern philological standards. Moreover, some of the works that do survive on their own were already available in reliable editions. Research on Plants, Plant Explanations and the well known Characters are clear cases. The so-called *opuscula*, Theophrastus' short scientific treatises, are, however, another matter. Some had been edited in recent years, but others remained largely neglected. It was, therefore, decided to continue the work of Project Theophrastus by producing scholarly editions with translations of the *opuscula*.

The three *opuscula* contained in this volume are first fruits. They are the physiological treatises of Theophrastus, concerned with the human phenomena of sweat, dizziness and fatigue. The Greek texts are based on new readings of the principal manuscripts. The texts are accompanied by an apparatus and a facing English translation. Other *opuscula* will be published in due course. *On Weather Signs* is close to completion and will appear in a volume by itself.

Theophrastus, *On Sweat*

William W. Fortenbaugh

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PREFACE

Work on this edition of *On Sweat* began in the spring of 1994, when Josip Talanga was visiting Rutgers as a Feodor-Lynen Fellow. We shared an interest in Peripatetic philosophy, and together we offered a graduate course on the *opuscula* of Theophrastus. Central to the course was *On Sweat*. Josip took it upon himself to provide the students with a working text. He xeroxed the edition of Wimmer, both Greek text and Latin translation, added parallel passages from Book 2 of the pseudo-Aristotelian *Problems*, and provided a vocabulary of Greek terms with English translation. As a result, the students, Josip and I were able to get our teeth into a difficult text. We solved some problems, identified others and recognized that we had only scratched the surface. It then became my task to continue the work on the treatise: to establish a Greek text, to provide an English translation and to add notes on difficult passages. The final result is this edition. It has benefited from suggestions made by many scholars over the intervening eight years. In the following paragraphs, I shall have occasion to name some of them. I want, however, to underline the collegial assistance provided by Josip at the very beginning of the project: δοκεῖ γὰρ πλεῖον ἢ ἡμῖν τοῦ παντὸς εἶναι ἡ ἀρχή.

My work on this edition was often interrupted by my duties at Rutgers University and by a different project, namely, a commentary on the rhetorical and poetic fragments of Theophrastus. I was able, however, to devote much time during the summer of 1996 to *On Sweat*. Especially valuable was a conference hosted by André Laks at the Université Charles de Gaulle-Lille III. There all the *opuscula* of Theophrastus were discussed, and I was fortunate to meet Armelle Debru. I want to thank her for instructive criticism both during the conference in Lille and later through private correspondence.

Also during the summer of 1996, I was able to visit Herwig Görgemanns in Heidelberg, where we discussed several difficult passages. We remained in contact and a similarly profitable visit occurred in 1999. I am pleased to have published the first fruits of my research in *Mousopolos Stephanos: Festschrift für Herwig Görgemanns*, Winter Verlag 1998.

In the course of 1996–7, I received helpful communications from Daniela Manetti, Mario Battezzare, and Suzanne Amigues, and in fall

1997 *On Sweat* was the topic of three seminars at Rutgers University. Jennifer Kosak, a colleague at the time, participated in these seminars and offered thoughtful comments.

In the spring of 1998, I was fortunate to receive advice from two medical doctors, who specialize in dermatology. Eva Bamberger Stahl introduced me to basic publications on sweat, and A. Bernard Ackerman read portions of my work and reacted with incisive criticism. I am grateful to both for taking an interest in what has been primarily a philological project.

In the summer of 1999, Georg Wöhrle organized a conference in Trier, Germany on the *opuscula* of Theophrastus. A session was devoted to *On Sweat*, Armelle Debru submitted a written paper, and both Anthony Preus and Philip van der Eijk commented on Debru's paper and on difficult passages in my edition. I learned much from their comments and from those of other participants, including Tiziano Dorandi, Hans Gottschalk, Richard King, Marlein van Raalte, Amneris Roselli and Michael Sollenberger. After the conference, I continued to work on the edition and completed the project in the spring of 2002. During this final period, I corresponded with Sabine Vogt, and as often before, I turned to Robert Sharples for criticism and advice. In notes I have tried to acknowledge his more important contributions; here I want to state clearly that without his prompt and generous responses, this edition might still be a work in progress.

My work has also benefited from various kinds of institutional support. A fellowship granted by the Bogliasco Foundation enabled me to spend the spring of 1999 at the Centro Studi Ligure, where I worked on several projects including my edition of *On Sweat*. Photographs and photocopies of manuscripts containing *On Sweat* were provided by The British Museum in London, The Citizens' Library of Bern, The Marcian Library in Venice, The Medieval Institute at The University of Notre Dame, The National Library in Paris, The University Library in Leiden, The Vatican Library in Vatican City, and The Vatican Microfilm Collection at Saint Louis University. The Vatican Library was of especial importance, for there I was permitted to take in hand the primary manuscript, Vaticanus Graecus 1302. Finally, a microprint of the Aldine Edition was furnished by the Alexander Library of Rutgers University; the staff of that library assisted me by obtaining secondary materials through inter-library loan.

In conclusion, I want to do something unusual in an academic preface, but irresistible in an edition of *On Sweat*. I want to remember Neil Buckley, who gave direction to my life at a young age. He was my sixth grade teacher at the Haverford School and from seventh through twelfth

grade my wrestling coach. He taught me much about sweat: how to win and to lose while sweating, and most importantly, the value of persistence. He taught me and all his boys to be prompt for practice, to work hard, and to make weight the old-fashioned way, by sweating off the pounds. Hurrah for Neil, and hurrah for another person who has been with me and supporting me for some forty-three years. I am referring to my wife Constance, who continues to be a wonderful person. It is right that this volume be dedicated to her along with the wives of the other contributors: δεῖ μνημονεύειν ὑφ' ὧν καλῶς τις πέπονθεν.

W.W.F.
Rutgers University
December 2000

INTRODUCTION

1) The Manuscript Tradition

The oldest manuscript containing the text of Theophrastus' work *On Sweat* is codex Vaticanus Graecus 1302 = A.¹ The manuscript dates from the beginning of the 14th century.² The text presented by A is marred by numerous errors and lacunae. In addition, the outer edge of several folios is worn, and the use of tape to prevent further deterioration occasionally makes the text difficult to read.³ All other manuscripts containing the text of *On Sweat* are dependent upon A;⁴ their variant readings are essentially emendations and conjectures like those found in the several modern editions.⁵ It can be assumed that the text printed in this edition is that of A, unless a notice in the *apparatus criticus* indicates otherwise. Such a notice always reports the reading of A. Other manuscripts are cited only when they offer a different reading which may be helpful in establishing what Theophrastus wrote;⁶ and in such cases, I cite only the earliest manuscript

¹ In choosing the letter A to refer to codex Vaticanus Graecus 1302, I am following Schneider vol. 4 p. 174–5 and Wimmer (1862) p. xxiv. The same letter is adopted by Ross and Fobes (1929) p. xxvi and by Laks and Most (1993) p. li in their editions of Theophrastus' *Metaphysics*.

² In *Textgeschichtliche Untersuchungen* (1974) p. xxx, W. Burnikel assigned codex A to the 13th century. Subsequently he and J. Wiesner, "Der Vaticanus 1302—Konvergenz einer Diskussion," *Mnemosyne* 29 (1976) p. 141–2, have agreed that the codex should be assigned to the first half of the 14th century. G. Prato, "Scritture librerie arcaizzanti," *Scrittura e Civiltà* 3 (1979) p. 186–8 is in general agreement, favoring a date between the end of the 13th and the beginning of the 14th century.

³ The text of *On Sweat* runs from f. 108^v v. 2 to f. 113^r v. 14. Only f. 108^v, 110^r and 110^v are free of tape. Especially difficult to read are f. 109^r v. 23–30 (= 8.47–9.53), f. 112^r v. 27–31 (= 33.208–12) and 112^v v. 24–31 (= 36.232–38.238).

⁴ The primacy of codex A has been established by W. Burnikel, *Textgeschichtliche Untersuchungen*; see the *stemma codicum* on p. 90. N. Wilson, reviewing Burnikel in *Gnomon* 51 (1979) p. 59–60, is in agreement concerning the status of A. See also the introduction to the recent edition of Theophrastus' *On Odors*, by U. Eigler and G. Wöhrle p. 8–9.

⁵ The same is true of the *editio princeps*, the Aldine edition (1497 A.D.), which differs from a Renaissance manuscript only in being printed. See Burnikel p. 22–31.

⁶ Variant readings which are not helpful in the stated way are ignored in the *apparatus criticus*, even if the readings may be of interest for some other purpose, e.g., for establishing groups or families of manuscripts. Hence, the variant readings cited by Burnikel p. 16 as typical of the family δ do not appear in the *apparatus* of this edition.

to exhibit the reading.⁷ That gives as lean an *apparatus* as possible, without suppressing relevant material.

There are excerpts from *On Sweat* in Photius' *Library*, and these seem to be drawn from a codex independent of A. There are also closely related passages in the pseudo-Aristotelian *Problems*. Both can be helpful in understanding and emending the text of *On Sweat*; but together they cover only a portion of the Theophrastean treatise. Moreover, each must be used with care. I return to these works in Sections 2 and 3. Here I want to emphasize that the text preserved by codex A may be closer to the Theophrastean original than is sometimes imagined. For if we are dealing with lecture notes, it seems entirely possible that Theophrastus chose to express himself with a brevity approaching opacity. He could, after all, supply the needed words and generally adapt his material to suit the occasion. I have taken this possibility seriously, and in editing the text, I have resisted emendations which seem unnecessary, especially those supplements which are more an enhancement than a clarification of the text. I have, however, tried to assist the reader by expanding the accompanying translation, usually by adding words in brackets, thereby making clear what is understood but not expressed in the Greek text. In addition, I have used the *apparatus criticus* to record many of the emendations and conjectures of earlier editors; and in the Additional Notes, which follow the text-translation, I have discussed *inter alia* various textual problems, often with reference to the context in which they occur.

Since codex A is fundamental, I have almost always reported its mistakes.⁸ Exceptions include errors in accent and breathing,⁹ and simple er-

⁷ The codices cited in addition to A are ten: BDHMORSVV^a and z. The *sigla* are those of Ross-Fobes and Laks-Most. They are explained in the list of *sigla* which precedes the text proper. The dates given are for the most part those of Burnikel. (In the case of R and M, I follow Laks and Most p. lvii and lxi; but the difference is minor and there is agreement that M is copied from R.) When two or more codices contain the same emendation by a second hand, it may be uncertain which codex was the first to be emended. For establishing what Theophrastus wrote, the uncertainty is inconsequential (see the preceding note). The older codex is cited, and others may or may not be mentioned in the Additional Notes. See, e.g., the note on I.2.

⁸ Abbreviations, both within and at the end of a line, are not mistakes. On the whole, they are easily understood and therefore not recorded. Similarly the omission of iota subscript is regular practice and therefore not recorded.

⁹ When the reading of codex A is clearly correct except for an erroneous accent or breathing, I do not report the reading with its mistake(s); but in those places where the reading of A is doubtful and emendations have been proposed, I report the reading of A including accent and breathing. Cf. 10.62, where ἀναδιδῶσι has been printed, ἀναδιδῶσι, is the reading of A, and ἀναδοθῶσι is an attractive conjecture.

rors in word division: e.g., codex A has ἐπὶ πολλῆς at 39.244, where ἐπιπολλῆς is wanted. Other forms of misspelling are regularly recorded in the *apparatus criticus*, even those errors which are easily corrected: e.g., at 11.72–4 ἀνομίας and παχύτις are errors for ἀνομοίας and παχύτης. That expands the *apparatus criticus*, but such errors are relevant to an overall assessment of the codex.¹⁰

When a word is known to occur in more than one form, I have regularly printed the form found in codex A: e.g., at 5.30 ἄνοσμος, the reading of A, has been printed, and not ἄοσμος, which is preferred by several editors.¹¹ Similarly, I have not introduced contracted forms, where codex A speaks for an uncontracted form: e.g., at 39.242 ἀχρόους has been printed, and not ἄχρους.¹²

A special case of correct spelling is the verb “to sweat”: i.e., ἰδροῦν (ἰδρό-ειν). According to the rules for omicron-contract verbs, ἰδροῦσι should be the form of the present active indicative third person plural. In codex A, the form occurs seven times: 27.181, 31.198, 32.201, 33.211 (a correction *supra lineam*), 34.214 (also a correction), 217 and 38.236 (in the printed text, a correction, ἰδροῦντες, will be found). There is, however, a variant form, ἰδρῶσι, which is found eight times: 24.163, 25.166, 29.189, 30.194,¹³ 33.207, 211 (before correction), 34.214 (before correction) and 36.226.¹⁴ According to Liddell and Scott, the variant is a contraction of ἰδρῶ-ουσι and not of ἰδρό-ουσι.¹⁵ For our purposes, the important point is that codex A exhibits both forms, so that an editor must decide whether to tolerate variation while remaining true to codex A, or to impose consistency by preferring one form over the other. Since the former alternative is in line with my general commitment to codex A, I have printed both forms as they occur in the manuscript.¹⁶ In particular, I have printed

¹⁰ Such errors may also be relevant to evaluating the extent of corruption in a particular section or line: e.g., at 14.92 ἐπιπολλῆς appears to be an error for ἐπιπολλῆς, but there is additional disturbance later in the same line, so that it seems prudent to record all mistakes at this point in A.

¹¹ I.e., by Heinsius, Schneider and Wimmer in both of his editions.

¹² The latter form is printed by Heinsius, Schneider and Wimmer in both of his editions. On the reading of codex A, see the Additional Notes, *ad loc.*

¹³ At 30.194, ἰδρῶσι occurs as part of the compound διῖδρῶσιν.

¹⁴ Identical in appearance but different *qua* grammatical form, the dative plural of the noun ἰδρῶς is found at 6.38, 7.43 and 11.74.

¹⁵ See LSJ p. 819 s.v.

¹⁶ In the two cases where the manuscript exhibits a correction, 33.211 and 34.214, I have printed the reading prior to correction and recorded the correction in the *apparatus criticus*. Burnikel p. xxxi reports that corrections in the text and margin of codex A are by a second hand. See the Additional Notes on 34.214.

ἰδρῶσι, even when the excerpt of Photius or the corresponding passage in the pseudo-Aristotelian *Problems* or both have ἰδρουῖσι: e.g., at 25.166 I have followed the codex and printed ἰδρῶσιν, even though Photius and pseudo-Aristotle have ἰδρουῖσιν.¹⁷

Theophrastus' own concern with good style is not in doubt, and his aversion to hiatus has been the subject of scholarly discussion.¹⁸ In emending the text, I have sometimes preferred an emendation which avoids hiatus to one which does not: e.g., at 16.113 θερμολουσίαις ἢ ψυχρολουσίαις has been printed, not θερμολουσία ἢ ψυχρολουσία, in place of θερμολουσίας ἢ ψυχρολουσίας, which is the mistaken reading of codex A. However, I have resisted altering the received text merely to avoid hiatus: e.g., at 27.182–3 I have printed the reading of A, οὔτε ὀλίγον, and not οὔτ' ὀλίγον, which removes hiatus.¹⁹ A special case occurs at 32.214, where A has μάλισθα ἰδρουῖσιν. There is hiatus here, but μάλισθα is corrupt. The hiatus could be preserved by printing μάλιστα, but the correct reading is more likely to be μάλισθ'.²⁰ Theophrastus will have not only avoided hiatus through elision but also made the voiceless consonant aspirate: he will have changed tau to theta. An identical change occurs at 36.227: μάλισθ' ἰδρωτικόν.²¹ There are, however, places where tau is not changed to theta: e.g., at 33.207 and 211, where μάλιστ' ἰδρῶσι(ν) occurs. In such cases, I have not made the consonant aspirate.²²

Similarly, I have been hesitant to add or to remove particles unless there is compelling reason to do so. I think especially of δέ, which occasionally appears redundant but may have an emphatic or apodotic use: e.g., at 1.6 δέ may be emphatic, and at 28.186 it may be apodotic. In any case, if δέ is removed at these places, I would not relegate the particle to the apparatus or pass over it in silence as has been done in recent editions.²³ Rather, I

¹⁷ On the single occurrence of ἰδίειν, see the Additional Notes on 28.184.

¹⁸ See the study of B. Einarson in the Loeb edition of *Plant Explanations* p. xxxi–xlvi.

¹⁹ Grangerius prints οὔτ' ὀλίγον. Furlanus and subsequent editors have printed οὔτε ὀλίγον.

²⁰ The scribe of codex A has created hiatus by adding the final alpha. The reading μάλισθ', i.e. that without the alpha, is found in codex D, younger codices, the Aldine and all subsequent editions.

²¹ In fact codex A has μαλλισθ' ἰδρωτικόν. The double lambda is a simple mistake, perhaps encouraged by the double lambda in μάλλον, occurring earlier in the same line.

²² As, e.g., Wimmer does at 33.207 and 211 in both of his editions. Codices B and H and the Aldine edition have μάλισθ' at 33.211; μάλιστα at 33.207.

²³ In his list of variant readings (vol. 5 p. 174–5), Schneider reports the occurrence of δέ at 1.6 and at 28.186; but Wimmer, in both his editions, makes no mention of these occurrences of the particle.

would signal deletion in the printed text itself through the use of square brackets. That would be consistent with the primacy of codex A and call attention to emendations which involve judgment concerning correct usage and good style.²⁴

2) The Excerpts of Photius

The *Library* compiled by Photius, Byzantine scholar and patriarch of Constantinople (c.810–895 A.D.), contains selections from *On Sweat* (278 528b28–529b10). They do not cover the entire work and are concentrated in the second half. Section 2 is rather fully reported, but we are offered only the briefest statement concerning sections 5–10. More complete coverage begins with section 18, and even then we find whole sections passed over. Nevertheless, the Photian excerpts are of special importance. They appear to have been drawn from a codex independent of A, and in some places they preserve material which enables us to understand and to correct the manuscript tradition.²⁵ For that reason, I have decided to print the excerpts in a “first” apparatus of parallel texts.²⁶ Translations will be found on the facing pages. Other relevant passages, primarily, but not exclusively, those found in the pseudo-Aristotleian *Problems*, are listed but not quoted in a “second” apparatus of parallel texts.

The general character of Photius’ excerpts is discussed in detail by Burnikel.²⁷ Here I offer only a few observations which are intended to encourage prudent use of the Photian material. First, Photius uses ὅτι to introduce his excerpts²⁸; and used in this way, ὅτι is not part of the Theophrastean material which Photius reports. It depends on a verb like ἀνεγνώσθη, “was read” (sc. by me, Photius),²⁹ and should not be confused with ὅτι meaning “because.”³⁰ Accordingly, it is a mistake to reproduce

²⁴ Were complete consistence a desirable goal, I would favor using square brackets in the printed text whenever a reading of codex A is rejected as a faulty addition to what Theophrastus actually wrote. But there are, I think, limits: e.g., the repetition of the second alternative at 16.113 (ἡ ψυχρολουσία, see the preceding paragraph) is so clearly a case of dittography that to print the repetition in the text is to do little more than to create clutter.

²⁵ Burnikel p. 142.

²⁶ I have printed the text of R. Henry, Budé edition vol. 8 p. 167.15–169.24. Occasionally I record a variant reading reported by Henry in his *apparatus criticus*.

²⁷ See esp. the chapter “Die Exzerpte des Photius” on pages 131–42.

²⁸ In regard to *On Sweat*, see 278 528b29, 35, 37, 529a10, 12, 13, 22, 29, 31, 35, 37, 41, 529b7.

²⁹ See 278 525a31–3 = no. 365A.1–2 FHS&G and Sharples p. 25–6.

³⁰ The occurrences at 528b29 and 529b7 are instructive, for the excerpts which follow

Photius' introductory use of ὅτι, as has been done occasionally at 25.166.³¹ Furthermore, the use of ὅτι to signal the beginning of an excerpt does not rule out backtracking. For example, we have ὅτι at 529a12 introducing an excerpt based on the Theophrastean lines 21.141–2. A second ὅτι occurs at 529a13 introducing a new excerpt based on lines 143–4. Nevertheless, at 529a15 we have words, δόξει ἄτοπον εἶναι, which properly belong to the first excerpt: i.e., they go back to line 141 of the Theophrastean text. Burnikel remarks that the reference of ἄτοπον is unclear.³² That is correct. By breaking up a single section with a second ὅτι and by rearranging the Theophrastean material, Photius has created an obscurity which is not present in the original.

Although the codex from which Photius made his excerpts may have been better than A in some places, it was not free of all errors and sometimes may have been marred by serious omission. Burnikel cites section 25 of *On Sweat*. At the beginning of this section (lines 166–8), the text of A contains four errors, none of which is reproduced by Photius. But in what follows (line 170) the text of Photius (529a26) omits a clause, and that omission turns the section on its head.³³ Burnikel concludes that the codex from which Photius made his excerpts lacked the clause in question.³⁴ That may well be the case, though it cannot be excluded that Photius himself was careless at this point.

Another puzzling text is Photius' excerpt of sections 21–2. For here Photius not only breaks up the opening statement with a second ὅτι, as mentioned above, but also reformulates the statement, so that it concerns difference in degree (529a13).³⁵ Furthermore, the mention of pores which are closed through lack of use (529a18–19) has lost its Theophrastean con-

include an explanation introduced by δίοτι. In the first case, the δίοτι. (528b29) is also found in our Theophrastean text at 2.7. In the second (529b8), it replaces ὅτι ("because") at 40.248.

³¹ See Wimmer *ad loc.*, both editions, Burnikel p. 133, 154, and below "Additional Notes" *ad loc.*

³² Page 139.

³³ In sec. 25, Theophrastus tells us that men do not sweat more when exerting themselves, for exertion fills the vessels with breath and that in turn closes the pores. "But once they stop (the vessels) contract so that more moisture passes out through (pores) which are wider and as it were opened up" (170–1). In Photius' text the words "But once they stop (the vessels) contract" are omitted (529a26), leaving the impression that somehow the pores are both closed and open while exertion is occurring.

³⁴ Page 133.

³⁵ Photius has changed the statement of the problem by introducing μᾶλλον in 529a13. See the Additional Notes on 21.141–4.

text,³⁶ and the concluding statement concerning the effect of concoction (529a20–2) has no parallel in codex A. Burnikel suggests that the differences are attributable to two versions of the text, but he also notes, if only to reject, the possibility that the differences depend on Photius' attempt to organize and to clarify the words of Theophrastus.³⁷

On one occasion, Photius summarizes drastically and yet appears to introduce material on his own. I am thinking of 528b35–7: “That sweat, being salty, acquires in addition acidity or bitterness or bad odor or good odor on account of many and different causes.”³⁸ The second part of this sentence — from “acidity” to “causes” — concerns Theophrastus' remarks on malodorous sweat, sections 5–10, running 40 lines. Photius correctly mentions Theophrastus' interest in causes, but he reports no details. Curious is the mention of “good odor,” for our text of *On Sweat* fails to mention such odor. We may be tempted to say that Photius refers to material which has fallen out of the manuscript tradition, but that is not certain. It is also possible that Photius has added material on his own.³⁹ We may compare the preceding words “acidity or bitterness.” Acidic odor is indeed mentioned by Theophrastus at 5.30, but bitterness is not. Perhaps, then, Photius, is summarizing without attention to detail. In fact, he may be as much influenced by the introductory section, 1.5–6 — Theophrastus speaks of considering “why sweat is salty or acidic or has bad odor” — as he is by sections 5–10 on malodorous sweat.⁴⁰ But whatever the truth concerning influence, Photius adopts his own mode of expression⁴¹ and adds, perhaps for balance, two items not mentioned by Theophrastus.⁴²

³⁶ In codex A, the immediate context is the effect produced by extended periods of sweating-off (22.146–8). In Photius' excerpt, the practice is not explicitly mentioned.

³⁷ Burnikel p. 141–2; see also p. 143.

³⁸ ὅτι ὁ ἰδρῶς ἀλμυρὸς ὦν προσλαμβάνει ὀξύτητα ἢ πικρότητα ἢ δυσωδίαν ἢ εὐωδίαν διὰ πολλὰς καὶ διαφόρους αἰτίας.

³⁹ The most striking Theophrastean example of a Byzantine addition intended to balance bad with good is found in the spurious prologue to the *Characters*. There Theophrastus is made to say that he will record good as well as bad traits of character (prol. 2–3), but the collection which follows contains no sketch of good character.

⁴⁰ Even the words διὰ πολλὰς καὶ διαφόρους αἰτίας (528b36–7) — which correctly reflect Theophrastus' concern with causes in sections 5–10 — appear to be influenced by words in the introductory section: ἡ τὰς ἄλλας ἔχων διαφορὰς (1.5).

⁴¹ The first part of the sentence, ὁ ἰδρῶς ἀλμυρὸς ὦν προσλαμβάνει (528b35), is transitional in character and clearly attributable to Photius.

⁴² A different and simpler case of intervention by Photius may be the variation in word order occurring at 27.180. While codex A reads μετὰ δὲ τοὺς δρόμους καὶ τοὺς πόνους, Photius (529a29) has μετὰ τοὺς πόνους καὶ τοὺς δρόμους. It is, of course, possible that the variation reflects the manuscript used by Photius, but it is more likely that the varia-

Before concluding, I want to look briefly at section 30, for it provides, I think, a clear example of Photius introducing material found outside the section under consideration. Section 30 begins with a phrase referring generally to parts of the body borne down below the water (line 193). The Greek is not pretty, and Photius chose to replace the phrase with a specific reference to feet immersed in water (529a31–2). In doing so, he was almost certainly influenced by section 35, which concerns feet and shins immersed in water (line 222). Photius subsequently passed over section 35 and left us with a single hybrid excerpt — mostly section 30, but contaminated from 35 — in which the subject has been restricted in a way that misrepresents the Theophrastean original.⁴³

The preceding remarks are not intended to discourage careful evaluation of Photius' excerpts. They permit minor corrections, including small supplements to the received text. My purpose is rather to encourage a case by case evaluation of the excerpts. Some changes will be accepted as necessary, while others will be resisted as unnecessary and probably the result of Photius' desire to clarify and enhance what is at best a difficult text.⁴⁴

3) The Pseudo-Aristotelian *Problems*

The treatise *On Sweat* was used by the compiler(s) of the pseudo-Aristotelian *Problems*.⁴⁵ That is especially true of *Problems*, Book 2, which carries the heading "Όσα περὶ ἰδρώτα, "All the (Problems) concerning Sweat" (866b8), but there are other places in the treatise, where the compiler draws on the Theophrastean work.⁴⁶ I have collected these passages,

tion is attributable to Photius himself. In either case, there is no good reason to prefer the word order of Photius to that of codex A. See the Additional Note on 27.180–2.

⁴³ The interpretation is one of two put forward by Burnikel p. 135–6. See the Additional Notes *ad loc.*

⁴⁴ For example, I have rejected περίττωμα at 2.9 = 528b31 and τοῦ περιττώματος at 20.134 = 529a8, for in these cases Photius seems to have added to the text, in order to clarify what Theophrastus said in briefer form. Moreover, it is not entirely certain that περίττωμα is wanted at 2.9. See the Additional Notes on 2.9 and 20.134. Similarly, I have decided not to print τὸ ὑγρὸν and τῶν ὑγρῶν at 19.129 = 529a4 and 130–1 = 529a7. Again see the Additional Notes on 19.128–9 and 19.129–31.

⁴⁵ Dependence on Theophrastus is a matter of agreement among scholars. See, e.g., Forster (1921) p. 166–7 and Flashar p. 335–8.

⁴⁶ In some cases the assignation of material to a book other than *Problems* 2 is both remarkable and intelligible. For example, material taken from *On Sweat* 13.83–9 has been included in *Problems* 5 which carries the heading "All the (Problems derived) from Tiredness." The inclusion (at 5.27 883b26–32) is remarkable, because tiredness is the topic of a separate Theophrastean treatise, Περὶ κόπων, *On (Types of) Fatigue* = 328 no. 10 FHS&G. It is intelligible, because the physiology of fatigue is related to that of sweat (e.g.,

and, as stated in Section 2, I have reported them in a “second” apparatus of parallel texts.⁴⁷ In doing so, I have been selective. Only those passages which exhibit a direct relationship to *On Sweat* have been listed. Those passages which discuss the same general topic, but do so from another point of view, have been omitted. For example, both *On Sweat* 9.55–8 and *Problems* 2.14 867b19–21 concern sweat under the arms. But in *On Sweat*, the specific topic is bad odor; in the *Problems*, it is the quickness and copiousness with which sweat is secreted. For that reason *Problems* 867b19–21 does not appear in the apparatus to 9.55–8; it is, however, mentioned in the Additional Notes.⁴⁸

The parallels in the *Problems* can assist us not only in understanding but also in emending the Theophrastean text. Caution is, however, necessary, for the compiler of the *Problems* is capable of adapting his source. He may, for example, introduce his own words and add material not found in *On Sweat*. Furthermore, he may draw on the same Theophrastean text in two different places, producing either nearly identical doublets or two quite distinct passages. An extreme case of repetition with minimal variation is the pair 2.13 867b8–11 and 20.33 926b16–19.⁴⁹ These texts are parallel to 10.61–2, where the discussion concerns rue as a cause of foul smelling sweat. The explanation given at 867b9–11 and again at 926b17–19 suggests what may have fallen out at 10.62, but a supplement for printing in place of the lacuna cannot be gained from the parallels in question.⁵⁰

Other pairs may be quite different from each other. I cite 4.12 877b36–9 and 13.8 908b20–3. Both passages are parallel to *On Sweat* 9.55–8; they deal with the foul smell of sweat secreted in the armpits. However, the

colligescence is important to both phenomena), and the primary focus of the texts in question is not sweat but ulcers produced by exertion. See Flashar p. 480.

⁴⁷ Parallels in the *Problems* make up the bulk of the second apparatus; there are, however, occasional references to other works: e.g., to Aristotle's *On the Soul* and *Meteorology*.

⁴⁸ Even in the Additional Notes, I try to be selective. E.g., no reference will be found to either *Problems* 35.2 964b29–31 or 35.8 965a23–32. These passages mention the armpits and therefore might seem appropriate to a note on 9.55–8. But they are excluded, for they are concerned with tickling and laughter, and not with sweat.

⁴⁹ It seems impossible to determine with certainty which of the two parallel texts was written first. The second mentions pungency as well as heaviness of smell. See the Additional Notes on 10.61–2.

⁵⁰ For a second pair of nearly identical doublets, see 2.17 867b34–868a4 and 36.2 965b4–13, both chapters being parallel to *On Sweat* 33.207–12. The most interesting difference between the chapters concerns the verb “to sweat.” At 2.17 867b34 we find ἰδρῶσιν, at 36.2 965b4 ἰδίονσι. At *On Sweat* 33.207 ἰδρῶσιν occurs. For the verb ἰδίειν in *On Sweat*, see 28.184 and the Additional Notes *ad loc.*

passages are not doublets. The earlier of the two is, in fact, only part of an answer to why skin acquires odor at puberty. The answer is begun without explicit reference to sweat (4.12 877b22–6), and in what follows mention is made of plants and ashes (877b26–9), neither of which is found in the relevant portion of *On Sweat*. A reference to semen and ejaculation (877b30–2) brings us close to Theophrastean material; the subsequent reference to open pores (877b34) has a direct relationship to *On Sweat* 8.48. The closing reference to armpits seems an odd addition to the chapter (877b39), until one notices that a similar reference follows in *On Sweat* 9.57. The later passage is shorter but equally instructive. It is Theophrastean in that it explains bad odor by reference to lack of ventilation and rot (13.8 908b21–2, picking up 9.56–7), but there is variation in vocabulary (908b21 δυσωδία instead of κακωδία 9.56, 59)⁵¹ as well as the addition of an explanation (908b22–3) not found in the relevant portion of *On Sweat*.

Problems 2.1 and 2.20 divide up the material found in *On Sweat* 25–6. *Problems* 2.1 draws only on *On Sweat* 25 (866b9–13 = 25.167–8, 171–4); it contains a final comment not found in *On Sweat* (866b13–14). In contrast, 2.20 draws on both 25 and 26 (868a15–20 = 25.166, 168–71 and 868a20–5 = 26.175–9); it contains no comment without parallel in *On Sweat*. What especially interests me here is that a reader comparing the opening words of *Problems* 2.20 with the corresponding portion of *On Sweat* may think that the two texts are concerned with different phenomena. For while *Problems* 2.20 speaks of men sweating when they cease to exert themselves: ὅτε παύσονται ἰδροῦσιν (868a15), Theophrastus speaks of men sweating more: ἀλλ' ὅταν παύσωνται μᾶλλον ἰδρῶσιν (166). The absence and presence of the comparative adverb, i.e. μᾶλλον, might encourage a reader to conclude that while *Problems* 2.20 is concerned with cases in which there is no sweat until exertion ceases, Theophrastus is concerned with cases in which there is some sweat, albeit less. And having drawn that conclusion, the cautious reader might think it inadvisable to use *Problems* 2.20 to interpret *On Sweat*. Such a conclusion would be, I think, hasty, for *Problems* 2.20 soon introduces comparatives, εὐρυτέρων and ῥᾶον (868a19),⁵² and agreement in vocabulary and structure makes clear that the compiler of the *Problems* has drawn on *On*

⁵¹ Cf. the use of the adjective δυσώδης at *Problems* 4.12 877b23, 26, 35, 37.

⁵² The single word ῥᾶον at 868a19 invites comparison with 26.179, where ῥᾶον also occurs. Nevertheless, the entire phrase ῥᾶον διέρχεται at 868a19 has its parallel in μᾶλλον ἐξέρχεται at 25.171.

Sweat.⁵³ We should, therefore, consult *Problems* 2.20 when interpreting *On Sweat* 25–6 (especially 26), but we should do so with considerable care.

The preceding remarks indicate difficulties in using the *Problems* to correct corrupt passages in *On Sweat*. It may be helpful to add a specific warning against using the *Problems* to polish or to enhance the Theophrastean text. For example, 13.83 is intelligible as transmitted. Theophrastus has finished discussing differences in sweat caused by different bodily conditions; now he turns to eruptions caused by residues which fail to be secreted along with sweat. In 13.83 Theophrastus says clearly and simply: ἐπεὶ διὰ τοῦτο ἔνιοι ὅταν πλείω πονήσωσιν ἔλκη ἔχουσιν, “On account of this (the secretion of residues is in accordance with the condition of the body), some men have ulcers, when they overly exert themselves.” Instead of ἔλκη ἔχουσιν, “have ulcers,” Forster proposes following *Problems* 5.27 883b26 and reading ἔλκη ἐκφύουσιν, “produce” or “generate ulcers.” His only comment is that the verb ἔχουσι is colorless.⁵⁴ That may be, but there is much in *On Sweat* which could have been expressed in a more colorful manner. Enhancement alone is not grounds for emendation.⁵⁵

I want to conclude my remarks on the *Problems* in much the same way that I concluded my remarks on Photius: namely, by stating clearly that my aim has not been to discourage careful examination of the *Problems*. On the contrary, I think that the numerous parallel texts are important for emending *On Sweat*. When there is agreement between the *Problems* and the text of Photius, then the case for emendation is especially strong. But even here, caution is necessary, for the agreement must be extensive or at least compelling, and what constitutes compelling agreement is not always clear.⁵⁶

4) References in the Apparatus to Editions and Commentaries

References to the Aldine edition (1497 A.D.) and to those of Grangerius (1576), Furlanus (1605) and Heinsius (1613) are kept as simple as possible. The editor’s name is given in abbreviated form (Ald., Grang., Furl. and Heins.) without specific folio or page number. That should cause little

⁵³ The two alternatives presented in *Problems* 2.20 868a15–20 and a20–5 correspond to the two explanations offered by Theophrastus in *On Sweat* 25 and 26.

⁵⁴ See *Classical Quarterly* 15 (1921) 168.

⁵⁵ For a different case of misusing the *Problems* to create a “better” text, see the Additional Notes on 2.8.

⁵⁶ See, e.g., the Additional Notes on 2.8 and 30.193–4.

or no difficulty. In the case of the Aldine edition, there are no notes and no accompanying translation, so that all references are to the Greek text. The edition of Grangerius is more complicated in that it includes not only a Greek text but also a Latin translation and notes or commentary. However, the text is divided into segments after which come the translation and notes. That makes it easy to consult the translation and notes together with the Greek text. In the edition of Furlanus, there is a Latin translation which faces the Greek text; there are also notes which follow the text-translation. The notes are ordered in accordance with the Greek text, so that relevant comments are easily found.⁵⁷ Heinsius' edition contains a Greek text; the facing translation is that of Furlanus. There are no notes.

Schneider's edition of the Greek text (1818) is not accompanied by a Latin translation; there are, however, notes of various kinds which occur in separate volumes (1818–21).⁵⁸ To deal with this complexity, I have adopted the following system: when referring to the Greek text, I give only Schneider's name in abbreviated form (Schn.), and when referring to the notes, I give in addition the relevant volume and page number.⁵⁹

In the case of Wimmer, we have two editions of the Greek text (1862 and 1866). When the editions agree I simply give Wimmer's name in abbreviated form (Wimm.). When the editions differ, the abbreviation carries a number in superscript (Wimm.¹ and Wimm.²). Wimmer's notes on the Greek text occur in introductory pages apart from the Greek text. To facilitate finding them, I give the relevant page numbers.

Two important articles by Forster (1927 and 1933) are cited in the apparatus. As in the case of Wimmer, so here I use numbers in superscript to distinguish between the articles (Forst.¹ and Forst.²).

In his book on the *opuscula* (1974), Burnikel proposes emendations to the Greek text. Since these emendations occur in various places and therefore may be difficult to locate, I give page numbers when citing Burnikel (Burn.).

⁵⁷ There are numbers within the Greek text itself which refer to the (end-)notes.

⁵⁸ I.e., the text is found in volume 1 and the notes in volumes 2, 4 and 5.

⁵⁹ On occasion, this seems clumsy, but the alternatives are either worse or not better. Worse would be no precise reference, for then the reader would be forced to expend time searching through the works in question. Not better is a system of abbreviations explained in the list of *sigla*, for such abbreviations would have to be interpreted, i.e., the list of *sigla* would have to be consulted. In addition, the use of abbreviations would not eliminate the need to identify the relevant page or pages of the volume in question.

THE TREATISE IN OUTLINE

In section 1 of the treatise, Theophrastus offers a brief introductory statement. He announces that a (fundamental) question will not be discussed and that attention will be given to certain qualities of sweat. The question is whether sweat occurs when moisture is secreted, or when breath passes through the skin and condenses. The qualities which will be discussed include being salty and having bad odor, i.e., the subjects of sections 2–4 and 5–10. By mentioning “other differences,” Theophrastus appears to indicate that he will do more than deal with saltiness and bad odor. At the very least he seems to be thinking of variations in sweat during a single episode, i.e., the subject of sections 11–12.¹

In discussing saltiness and bad odor, Theophrastus offers explanations.² He tells us that sweat is salty because matter which is foreign to the body and unconcocted is secreted. He attributes bad odor to lack of concoction resulting from a bad condition of the body. Similarly, his discussion of variations in sweat during a single episode includes explanation. He refers in particular to the intensification of exertion and the alteration of the body; and he comments generally that because the condition of the sweat is dissimilar, clearly the cause too is dissimilar.³ This concern with explanation runs throughout the treatise.

In sections 13–17, Theophrastus discusses eruptions of the skin. The discussion is an excursus, prompted by previous references to exertion and bodily condition.⁴ Exercise may remove impurities along with sweat, but when that does not happen, eruptions may result.⁵ In sections 18–23, Theophrastus returns to sweat and explains why some people have difficulty sweating, while others sweat easily. The explanation involves age, bodily condition and external temperature.

¹ See the Additional Notes on 1.5: ἢ τὰς ἄλλας ἔχων διαφορὰς.

² διότι at 1.5 is picked up by διότι at 2.7. Cf. the repeated use of αἰτία at 5.29, 33, 6.36.

³ δῆλον γὰρ ὡς ἀπὸ τῆς ἀνομοίας διαθέσεως ἀνόμοιον καὶ τὸ αἴτιον, 11.72–3.

⁴ For previous references to exertion and bodily condition, see 11.71–2 and 12.80–2 (a general statement concerning all cases, ἐπὶ πάντων); for references within the discussion of eruptions, see 13.83–5, 15.95–104, and 17.115–19.

⁵ See 13.83–9. The text at 13.86 is condensed but not corrupt. See the Additional Notes *ad loc.*

In sections 24–40, a series of problems are addressed. That the treatise makes, as it were, a new start is clear from Theophrastus' use of the verb "to sweat." In sections 1–23, the verb is not to be found, but beginning with section 24, it occurs with considerable frequency, especially in the third person plural, which takes two forms: ἰδρῶσι and ἰδρῶσι.⁶ Moreover, most of the problems set forth in sections 24–40 are discussed with comparative brevity.⁷ In addition, there is unresolved inconsistency between sections,⁸ and the ordering of the problems is not always perspicuous. Some problems seem to form a group, but there are places where a different order seems preferable.⁹ The general impression conveyed is that of an open ended string of problems which could be added to and modified at will.¹⁰ Indeed, the variation between ἰδρῶσι and ἰδρῶσι may reflect addition and modification over an extended period of time. In any case, it is not surprising that the third person plural is absent from the last two or three problems, i.e. from sections 38–40, for these problems are likely to be later additions either by Theophrastus or by someone else.¹¹

What follows is a schematic outline of *On Sweat*.

⁶ On the two forms, ἰδρῶσι and ἰδρῶσι, see the Introduction, Section 1.

⁷ That most of the discussions found within sections 24–40 are brief when compared with those of sections 2–23 is immediately clear on observation. Exceptional is the discussion of why men sweat more once they cease exerting themselves. It runs 14 lines (25.166–26.179), which is the length of the shortest discussion in sections 2–23, i.e., that of variations in sweat during a single episode (11.69–12.82).

⁸ In 25.166–72 and 29.189–91, we are told that restraining the breath during exertion prevents sweating; in 34.216–21, restraining the breath and exertion are said to be the cause of increased sweating. With the latter passage, cf. 33.212–13. N.B., I am not claiming that the inconsistency is irresolvable. My claim is only that the treatise exhibits apparent inconsistency which needs to be addressed. The fact that the relevant passages, sections 25, 29 and 34, are not contiguous, may be said to obscure the problem, so that the need for further discussion is not immediately obvious, but that is not the kind of explanation, which is needed to resolve the inconsistency. See the Additional Note on 33.212–13.

⁹ Sections 24, 32 and 33 might be grouped together (all concern sweating on the upper parts of the body), 36 might follow 33 (36 considers an exception to what is said in 33), and 30 and 35 might be placed next to each other (both discuss parts of the body submerged in water). On 25, 29 and 34, see the preceding note. However, the separation of 25 and 29 admits explanation. See the Additional Note on 29.189.

¹⁰ The shift from third person plural to first person plural in the course of section 34 is puzzling. It may reflect uneven composition or intervention at a later period. Or it may reflect no more than a shift in perspective. See the Additional Notes on 34.218–19.

¹¹ In sections 39 and 40, the absence of the third person plural, either ἰδρῶσι or ἰδρῶσι, is not in doubt. In section 38, codex A has ἰδρῶσιν in line 236, but the text is corrupt. An emendation, ἰδρῶντες, has been printed in the text.

Introductory Statement

- 1** Discussion of the source of sweat is postponed. The immediate topic is why sweat is salty or acidic or has bad odor or other differentiating qualities.

Explanations of Distinctive Qualities

- 2–5** Sweat is salty.

- 2** It is so, because it is foreign to the body.

- 3** And because it is unconcocted.

- 4** Some sweat appears not to be of this character; it is a matter of degree.

- 5–10** Sweat has a bad odor.

- 5–6** The fundamental cause is a lack of concoction resulting from a bad condition of the body. Eating certain foods is a contributing factor.

- 7–8** The sweat of adolescents smells worse than that of older and aged men, because adolescent bodies are driven sexually, have open pores and undergo change. The bodies of older men are stable; those of aged men breathe well.

- 9** There are parts of the body which breathe well and parts that do not.

- 10** Rue and certain unguents produce bad odor. More on lack of concoction.

- 11–12** Varieties of sweat occur through intensification of exercise and alteration in the condition of the body.

- 11** The superficial and first variety is watery and thin. That coming from deeper within is heavier.

- 12** It is said to resemble blood; more moisture is drawn from the vessels.

Explanations concerning Eruptions of the Skin

- 13–17** Ulcers and other eruptions are caused by excessive exertion and impurity of body.

- 13** When thick residues containing bad juices are not secreted along with sweat, ulcers occur.

- 14** Scab, ringworm and leprosy arise in a similar way.

- 15** The acne of adolescence is attributable to the condition of the body; road sores are brought on by exertion.

16 Eruptions should not be irritated. When salty sweat causes pimply swellings, a limited use of heat is beneficial.

17 Overexertion produces imbalance in secretion which results in eruption.

Explanations of Greater and Lesser Propensity to Sweat

18–23 Difficulty and ease in sweating depend on age, bodily condition and external temperature.

18–19 Children and especially young children have more difficulty sweating than men; aged men have difficulty sweating.

20 Men with moist intestines and a greater flow of moisture into the bladder have difficulty sweating. Men with the opposite condition sweat more easily, as do men who go sleepless.

21–2 Although strange, both men who exercise and those who do not, sweat easily. The same is true of men who take vapor baths.

23 For some men sweating is easier in winter, because the dry weather concentrates moisture in the body and cold weather does the same to heat. (A remnant of a new problem seems to end the section.)

Further Explanations of Various Phenomena

24 Men sweat more on the upper parts of the body, because the moisture, breath and heat are greater there.

25–6 Men sweat more once they cease exerting themselves.

25 The reason is that breath is released, vessels contract and pores open up.

26 And from breath as it cools there arises the moisture called sweat.

27–8 Men sweat more, after exerting themselves, in the shade than in the sun.

27 For the sun dries up the moisture, and in general the external heat must not be too great.

28 For this reason, men sweat less when they stand too near a fire or make a large fire straightway.

29 Men sweat less when running than having stopped, for restraining the breath and the movement of the air prevent sweating.

30 Men do not sweat on parts of the body immersed in water, for water prevents liquefaction.

- 31 Men sweat more after a pause in their exercise, because moisture accumulates during the pause.
- 32 Men sweat more on the back, because (the reason appears to have fallen out; what is said seems to relate to a different problem).
- 33 Men sweat especially on the face, because the head is moist and rare.
(A remnant of a new problem seems to end the section.)
- 34 Men sweat most when they rub the arms, if they maintain the same position, because they are especially strong in this region.
- 35 When men have their feet and shins in the water, they do not sweat on these parts—for the water prevents sweating—but on the upper body.
- 36–7 Men sweat on the feet and not on the face, when they are nervous.
 - 36 The reason is that nervousness involves an increase in heat.
 - 37 And heat dries the moisture on the face and effects colliquescence in the feet.
- 38 Cooling while sweating results in nausea, because moisture collects and attacks the region where breathing occurs.
- 39 Running in a cloak and applying oil cause lack of color on account of stifling.
- 40 During sleep there is more sweat, because everything is very moist and warm on account of the concentration of moisture and heat.

SIGLA

codex ex quo alii pendent

A = Vaticanus Gr. 1302 (no. 16 Burnikel), saec. xiv ineunte

codices alii qui in hac editione citantur

B = Bernensis 402 (no. 19 Burnikel), circa a.D. 1480

D = Ambrosianus P 80 sup. (no. 14 Burnikel), ante a.D. 1427

H = Leidensis Vossianus Gr. Q 25 (no. 18 Burnikel), a.D. 1487

M = Marcianus Gr. 260 (no. 12 Burnikel), a.D. 1442–57

O = Vaticanus Ottobonianus Gr. 153 (no. 24 Burnikel), a.D. 1450–75

R = Vaticanus Palatinus Gr. 162 (no. 13 Burnikel), a.D. 1442–57

S = Londinensis BL Add. 5113 (no. 15 Burnikel), a.D. 1480–7

V = Vaticanus Gr. 1305 (no. 30 Burnikel), a.D. 1469–77

V^a = Vaticanus Urbinas Gr. 108 (no. 17 Burnikel), brevi ante a.D. 1427

z = Parisinus Gr. 2277 (no. 23 Burnikel), a.D. 1479

editio princeps

Ald. = Editio Aldina (no. 22 Burnikel), a.D. 1497

aliae editiones et adnotationes ad textum

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Forst.² = E. Forster, "Further Emendations in Theophrastus," *The Classical Quarterly* 27 (1933) 140–1

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Wimm. = Wimm.¹ et Wimm.²

Wimm.¹ = F. Wimmer, *Theophrasti Eresii opera quae supersunt omnia*, t. 3 Leipzig: Teubner 1862

Wimm.² = F. Wimmer, *Theophrasti Eresii opera quae supersunt omnia*, Paris: Didot 1866

Auctores antiqui vel opera quae in apparatu occurrunt

Arist., De an. = Aristoteles, De anima (CB [Paris 1966] Jannone et Barbotin)

Diog. Laert. = Diogenes Laertius, Vitae philosophorum 5.36–58 (PhA t. 54 [Leiden 1992] FHS&G)

Phot. = Photius, Bibliotheca 278 528b–529b (CB t. 8 [Paris 1977] p.167–9 Henry)

Probl. = [Aristoteles], Problemata physica 1.1 859a1–38.11 967b27 (BT [Leipzig 1922] Ruelle, Knoellinger et Klek)

Θεοφράστου Περὶ ἰδρώτων

1

- 1 ὁ ἰδρὼς πότερον μεθ' ὑγρότητος εὐθὺς ἐκκρινομένης γίνεται ἢ
πνεύματος ὡς τούτου διϊόντος διὰ τῆς σαρκὸς εἴτ' ἔξω πηγνυται
καὶ συνίσταται καταψυχόμενον, ἕτερος ἔστω ἐν ἄλλοις λόγος.
διότι δὲ ἄλμυρὸς ἢ ὀξὺς ἢ κακώδης ἢ τὰς ἄλλας ἔχων διαφορὰς 5
νῦν δὲ πειρατέον θεωρεῖν.
- 2 ἄλμυρὸς μὲν οὖν γίνεται διότι τὸ ἀλλότριον ἐκκρίνεται πρὸς
φύσιν τῆς σαρκὸς ἐξανηλωμένου τοῦ γλυκυτάτου καὶ κουφο-
τάτου· τὸ γὰρ τοιοῦτον ἐν μὲν τῇ ὑποστάσει τῇ κατὰ τὴν κύστιν
οὖρον, ἐν δὲ τῇ σαρκὶ ἰδρὼς καλεῖται· πλὴν ὅτι συμβαίνει τὸ 10
μὲν αὐτομάτως καὶ οἶον αὐτῆς τῆς φύσεως ἐργαζομένης
ὑφίστασθαι, τὸν ἰδρῶτα δ' ἐκκρίνεσθαι διὰ τὴν κίνησιν ἢ πόνον
ἢ ἀπλῶς τὴν τοῦ θερμοῦ καὶ πνεύματος δύναμιν, διὸ καὶ τὸ μὲν
ἀεὶ τὸ δ' οὐκ ἀεὶ. συνεχὲς δὲ ἦττον (ἢ) ἢ τοῦ πνεύματος ἔκκρισις,
ἄφαντος δὲ τῇ αἰσθήσει, καθάπερ ἀτμίζοντος ἀεὶ τοῦ σώματος. 15
- 3 <ἄλμυρὸν δ' ὅτι> ἄπεπτον, τὸ δὲ πεπεμμένον γλυκύ, τὸ δ' ἐπι-
πολῆς ὑδατῶδες ὥσπερ τὸ φλέγμα καὶ δάκρυον. τάχα δὲ ταῦτα
μὲν εὐλόγως, τὸ μὲν ὅτι ἀπὸ τῆς τροφῆς, τὸ δ' ὅτι ἀπὸ τῶν περὶ
τὸν ἐγκέφαλον. ὁ δ' ἰδρὼς καθάπερ ἐκ σαρκὸς καὶ φλεβὸς ἐν οἷς
ἤδη μεταβολὴ τῆς τροφῆς, καὶ τύπῳ τοιαύτῃ καὶ οὕτως ὥσπερ 20

1 *Phot.* 278 528b28 (*CB t.* 8 p. 167.15) τοῦ αὐτοῦ Περὶ ἰδρώτων 7–10 et
12–13 *Phot.* 278 528b29–34 (*CB t.* 8 p. 167.16–21) ὅτι ἄλμυρὸς γίνεται ὁ ἰδρὼς,
διότι τὸ ἀλλότριον ἐκκρίνεται, τῇ προσφύσει τῆς σαρκὸς ἐξανηλωμένου τοῦ
γλυκυτάτου καὶ κουφοτάτου· τὸ γὰρ τοιοῦτον περίττωμα ἐν μὲν τῇ κατὰ τὴν
κύστιν ὑποστάσει οὖρον, ἐν δὲ τῇ σαρκὶ ἰδρὼς καλεῖται. ἐκκρίνεται δὲ ὁ
ἰδρὼς διὰ τὴν κίνησιν ἢ πόνον ἢ διὰ τὴν τοῦ θερμοῦ καὶ τοῦ πνεύματος
δύναμιν.

1 *Diog. Laert.* 5.44 = 1.121 et 328 no. 12 *FHS&G* 7–10 et 12–14 *Probl.* 2.3 8-
6b19–27 (*BT p.* 20.15–23)

1 Περὶ ἰδρώτων *A Phot. Diog. Laert. (F):* Περὶ ἰδρώτος *M Diog. Laert. (BP)*
2 ἰδρὼς *alt. manu R: lac. c. 9 litt. A:* δὲ ἰδρὼς *alt. manu M* μεθ' *A:* ὑφ'
Grang.: ἐξ *Schn. t. 2 p. 610, Furl. p. 240 praeunte* 3 ὡς τούτου *A:* τοῦ
συμφύτου *Schn. t. 2 p. 610:* συμφύτου *Wimm.* διϊόντος *Schn. t. 4 p. 779,*
praeunte versione Grang.: διϊέντος *A* εἴτ' *A:* ὅτ' *Schn. t. 2 p. 610 et t. 5 p.*
lviii: εἴ γ' *Wimm.* 4 καταψυχόμενον *A:* καταψυχόμενος *alt. manu supra lin.*
B λόγος *alt. manu supra lin. B:* λόγοις *A* 6 νῦν δὲ *A:* νῦν δὲ *O:* νῦν *Ald.*
7–8 πρὸς φύσιν τῆς σαρκὸς *A:* τῇ προσφύσει τῆς σαρκὸς *Phot.:* ἐν τῇ προσφύσει
τῆς σαρκὸς *Grang.:* ἐν τῇ προσφύσει τῆς (τροφῆς πρὸς αἷμα καὶ τὰς) σάρκας
Forst.² ex Probl. 866b21 14 συνεχὲς δὲ ἦττον (ἢ) ἢ *Furl.:* συνεχὲς δὲ ἦττον,
ἢ *A:* συνεχῆς δ' (οὐχ) ἦττον ἢ *Schn. t. 2 p. 610 et t. 5 p. lviii* 15 ἄφαντος
→

Theophrastus, *On Sweat*

- 1 Does sweat occur straightway with moisture when it is secreted, or (with) breath since this (the breath) passes through the flesh and then on the outside becomes thick and condensed through cooling? Let that be another discussion in a different place.¹ At this time we should try to consider why (sweat) is salty or acidic or has bad odor or possesses other differences.
- 2 (Sweat) is salty because what is foreign to the nature of flesh is secreted,² after what is sweetest and lightest has been consumed. For such (foreign matter), when it accumulates as waste in the bladder, is called urine, and in the flesh sweat. Only it happens that the former accumulates automatically and, as it were, with the nature (of the body) itself doing the work; but sweat is secreted on account of motion or exertion or generally the force of heat and breath. For this reason, too, the former is always occurring, and the latter not always. (The latter) is less continuous than the secretion of breath – but (the secretion of breath) is invisible to perception – since the body is always, as it were, steaming.
- 3 (What is secreted as sweat) is salty because it is unconcocted; what has been concocted is sweet; what occurs on the surface (of the skin) is watery, like phlegm and tears. Perhaps these (cases) are reasonable: the one because (sweat comes) from food, the other because (phlegm and tears come) from the (fluids) around the brain. Sweat comes as it were from flesh and vessels,³ in which food has already undergone change, and (the change) generally is of such a character and (occurs) in such a

1 Phot. 278 528b28 (CB vol. 8 p.167.15) By the same person (Theophrastus), *On (Types of) Sweat* 7–10 and 12–13 Phot. 278 528b29–34 (CB vol. 8 p. 167.16–21) (I read) that sweat is salty because what is foreign (to the body) is secreted, while what is sweetest and lightest has been consumed by the additional growth of flesh. For such residue, when it accumulates as waste in the bladder, is called urine; and in the flesh sweat. Sweat is secreted on account of motion or exertion or on account of the force of heat and breath.

¹ I.e., in another treatise or course of lectures.

² Or “what is foreign is secreted in view of the nature of flesh.” If we adopt the emendation of Forster, then the translation might be: “what is foreign is secreted in the process by which nourishment passes into blood and flesh.”

³ I.e., the blood vessels including both veins and arteries.

Grang.: ἄφατος A 16 ἄλμυρὸν δ' ὅτι ἄπεπτον, τὸ δὲ *scripsi*: *lac.* 9–10 *litt.* ἀπέπτον τὸ δὲ A: (τὸ μὲν ἄλμυρὸν) ἄπεπτον, τὸ δὲ *Grang.*: ἄλμυρὸς δὲ ὅτι ἄπεπτος· τὸ δὲ *Furl.* 20 ὥσπερ *Grang.*: ὥστε A

- κατὰ τὸν ἐγκέφαλον. ἐπεὶ καὶ ἐνταῦθ' ὅταν ἐκ συντήξεως (ἢ)
 4 ἄλλου τινὸς πάθους, ἀλμυρὸν τὸ πτύελον καὶ τὸ δάκρυον. ἢ
 τούτῳ μὲν μαρτυρεῖ τῷ λόγῳ τὸ πρότερον ὅτι ἰδρῶς πᾶς ἀλμυρὸς·
 εἰ δὲ πορρωτέρωθεν ἀλυκώτερος· οὗτος δὲ μᾶλλον τῇ προσφύσει
 δόξειεν, οὐκ ἂν τοῦ ἀλυσιτελοῦς ἢ ἔκκρισις εἴη. τὸ δ' ἀλμυρὸν 25
 πάλιν ἀλλότριον. ὑπὲρ μὲν οὖν τούτων σκεπτέον· ἔοικε γὰρ ὁ μὲν
 τις τοιοῦτος, ὁ δ' οὐ τοιοῦτος εἶναι τῶν ἰδρώτων. ἢ τό γε μᾶλλον
 καὶ ἦττον φανερώς.
- 5 ἀκόλουθον δέ πως τούτων αἰτίας ἐστὶ καὶ σχεδὸν τῆς αὐτῆς καὶ
 ὅτι ὁ μὲν κακώδης ὁ δ' ἄνοσμος ἐνίοις δ' ὀξὺς τῇ ὁσμῇ, καὶ ἄλλοι 30
 δὲ τρόποι τῆς κακωδίας· ἄπτονται γὰρ ταῦτα ὡς γένει λαβεῖν
 ἀπεψίας. τῆς δ' ἀπεψίας ὅτε μὲν ἀκαθαρσία τῆς κοιλίας, ὅτε δ'
 ὅλως καχεξία τις αἰτία. πολλάκις δὲ καὶ βρωμάτων τινὲς
 προσφοραί· καὶ γὰρ ταῦτα ποιεῖ τινὰς δυσωδίας ὥσπερ καὶ τὸ
 6 πηγανόν φασι. τάχα δὲ ταῦτα μὲν ὡς συμβαλλόμενα θετέον, τὴν 35
 δ' αἰτίαν τοῖς πρότερον ἀποδοτέον καὶ τι ἂν τῇ ὅλῃ τοῦ σώματος
 κράσει· πολλοὶ γὰρ τῶν γυμναζομένων καὶ δοκούντων εὖ ἔχειν
 βαρεῖς καὶ κακώδεις τοῖς ἰδρώσιν· ἐπεὶ ὅτι γε τῇ καχεξίᾳ πολλα-
 χόθεν φανερόν, ἔκ τε τῶν καμνόντων καὶ ἐκ τῶν ἀφροδισια-
 ζόντων πλείω ἔξιν ἐχόντων ἤδη καὶ τῶν δὲ θεραπευτῶν ἤδη ὅλως. 40
 7 ἄτοπον δ' ἂν δόξειε τοῦτο εἶναι καὶ ἐναντίωσιν τιν' ἔχον πρὸς
 ταῦτα καὶ πρὸς τὸ καθόλου λεχθέν, ὅτι οἱ περὶ ἥβην μάλιστα
 κακώδεις τοῖς ἰδρώσι, προΐουσης δὲ τῆς ἡλικίας ἦττον, καὶ οἱ

29–68 *Phot.* 278 528b35–7 (*CB* t. 8 p. 167.22–4) ὅτι ὁ ἰδρῶς ἀλμυρὸς ὦν
 προσλαμβάνει ὀξύτητα ἢ πικρότητα ἢ δυσωδίαν ἢ εὐωδίαν διὰ πολλὰς καὶ
 διαφόρους αἰτίας

39–40 et 47–9 *Probl.* 4.12 877b21–36 (*BT* p. 50.27–51.14) et 4.24 879a23–6 (*BT*
 p.55.10–13)

21 ἢ *add. Grang.* 23 τούτῳ *D*: τάτῳ *A* ὅτι *Furl.*: ὅτε *A*: ὅτ' *Grang.* 24
post ἀλυκώτερος *corrupt. sign. Wimm.* 25 ἀλυσιτελοῦς *Schn.* t. 2 p. 611:
 ἀλυσίου *A*: ἀλυκοῦ *Grang.* 26 πάλιν *A*: πᾶν *Wimm.* 29 ἀκόλουθον δέ
 πως τούτων αἰτίας ἐστὶ καὶ σχεδὸν τῆς αὐτῆς *A*: *ante* τούτων *add. τῆς Schn.*:
 ἀκόλουθον δέ πως τούτοις ἐστὶ καὶ αἰτίας σχεδὸν τῆς αὐτῆς *Schn.* t. 2 p. 611 *et*
 t. 5 p. lix καὶ (*alt.*) *del. Schn.* t. 5 p. lix 30 ἄνοσμος *A*: ἄοσμος *Hein.* 31
 γένει *Grang.*: γένη *A* 32 ἀπεψίας (*pr.*) *O*: ἄπεψις *A* ἀκαθαρσία *A*: ἀκα-
 θαρσία *Wimm.* 34 τινὰς δυσωδίας *A*: τινὰ δυσωδίαν *Grang.* (τινὰ) *Schn.*
 36 ἂν *abundare videtur, secundum Schn.* t. 4 p. 782 37 κράσει *alt. manu mg.*
B: κρατήσει *A* 38 βαρεῖς *alt. manu B*: βορῆς *A* 40 ἤδη *A*: τινὰ *Manetti*
 καὶ τῶν δὲ *A*: καὶ τῶν *Ald.* 41 τοῦτο *Wimm.*: τούτοις *A*: *del. Schn.* 42–3 *inter*
 μάλιστα *et* κακώδεις *supra lin. occurrit signum crucis simile A*

way as (that) in the area of the brain. For here, too, sputum and tears are salty, whenever they result from colliquescence or some other affection.

- 4 Or rather, whereas the earlier (assertion), that all sweat is salty, supports this account, still (there is a problem, for) if (sweat is drawn) from a greater distance, it is saltier.⁴ This (sweat) would seem (to arise) more through natural assimilation; it would not be secretion of what is useless. But again what is salty is foreign. Concerning these matters, then, there must be an investigation, for of the (occurrences of) sweat one seems to be of such a character and another not. Or it is clearly a matter of the more and less.
- 5 In conformity with these things, almost the same cause applies also to the fact that one kind (of sweat) has a bad odor, another is lacking in odor, (still another) in some people is acidic in odor, and there are other kinds of bad odor as well. Taken generically, these cases are connected with absence of concoction. The cause of the absence of concoction is sometimes impurity of the stomach, and sometimes generally a certain bad condition. Often, too, it is eating certain foods, for these
- 6 as well produce certain foul odors, as men say rue also does. Perhaps these (foods) ought to be put down as contributing factors, and the cause ought to be assigned to the things first (mentioned) and somehow to the entire blend of the body. For many of those who take exercise and seem to be in good condition have a heavy and bad odor when they sweat, (but this is misleading,) since it is clear from many things that (bad odor is caused) by the bad condition (of the body): from those who are sick and from those who, being rather frequently engaged in sexual activity, are already in a (bad) condition, and generally those who (as convalescents) are already attending (to the body).
- 7 In regard to these (observations) and to what is generally said, the following might seem odd and in a way contrary. Adolescents have especially bad odors when they sweat; with advancing age less, aged

29–68 Phot. 278 528b35–7 (CB vol. 8 p. 167.22–4) (I read) that sweat, being salty, acquires in addition acidity or bitterness or bad odor or good odor on account of many and various causes.

⁴ At the conclusion of this sentence Wimmer signals corruption. Certainly the text is difficult and suspect.

γέροντες οὐδαμῶς· † ἀλλ' ἡ βαρύτης τοῦ χρώματος. † καίτοι
 πεπτικωτάτη ἡ ἡλικία τῶν ἐν ἡβῃ· σημεῖον δὲ τὸ τῆς αὐξήσεως· ἡ 45
 δὲ τῶν πρεσβυτέρων ἦττον· τῶν δ' ἤδη γερόντων παντελῶς.
 8 αἷτιον δ' ὅτι πρὸς τὰ ἀφροδίσια μάλιστ' ἐν ὁρμῇ τῶν ἐν ἡβῃ, καὶ
 τῶν πόρων ἄνοιξις καὶ μεταβολή, πάντα δὲ ταῦτα συνεργὰ πρὸς
 κακωδίαν· ἡ δὲ τῶν πρεσβυτέρων * * * οἶά τις ἔξις ἤδη καὶ
 μένουσα· ἡ δὲ τῶν γερόντων διὰ μανότητα καὶ εὐπνους· διὸ καὶ 50
 οὔτε περιττωματική· ἅμα δὲ καὶ εὐπνουν (ἔχουσι τὸ σῶμα καὶ)
 ἀπερίττωτον, καὶ οὐδ' (ἐν ἐκκρίν)εται τοιοῦτον ἀφ' οὗ γίνοιτ' ἂν
 9 τὸ κακῶδες. ἐπεὶ καὶ διὰ τοῦτο καὶ ἐκ τῆς κεφαλῆς ἄσμος ἢ
 ἦττόν γε τοῦ ἐκ τοῦ σώματος, ὅτι εὐπνους ἡ κεφαλὴ· δημοῖ δ' ἡ
 [διὰ] τῶν τριχῶν ἔκφυσις * * * τὴν μανότητα. δυσώδης δὲ τόπος 55
 καὶ τὰ ἐν αὐτῷ, ὧς ἂν μὴ εὐπνοια· σήπεται γάρ, ἡ δὲ κακωδία
 σήψις τις. διὸ ὁ ἐκ τῶν μασχαλῶν ἰδρῶς καὶ ὅλως ὁ ἐκ τῶν κοίλων
 κακωδέστατος· καίτοι μανοί γε οἱ τόποι, ἀλλ' ἡ κατάπνιξις καὶ ἡ
 κοιλία ποιεῖ τὴν κακωδίαν. ταὐτὸ δὲ πέπονθεν ὁ τόπος ὁ τοιοῦτος
 καὶ ὅλως τὸ σῶμα πρὸς τὴν κακωδίαν· ἀπεψία γὰρ κακεῖ γίνεται. 60
 10 τὴν δὲ διὰ τὸ πῆγανον κακωδίαν καὶ ὑπὸ μύρων ἐνίων, ὅταν
 ἀναδιδῶσι, καὶ γὰρ τοῦτο συμβαίνει, λεκτέον· ὑπὲρ ὧν * * *
 γίνεται δὲ καὶ ὁ μὲν θερμός, ὁ δὲ ψυχρὸς ἰδρῶς, ὁ μὲν ὥσπερ

53–7 *Probl.* 2.6 867a4–7 (*BT* p. 21.12–15) 55–8 *Probl.* 4.12 877b36–9 (*BT*
 p. 51.14–17) et 13.8 908b20–3 (*BT* p. 139.1–4) 61–2 *Probl.* 2.13 867b8–11 (*BT*
 p. 22.25–8) = 20.33 926b16–19 (*BT* p. 194.7–10); cf. 13.9 908b24–8 (*BT* p. 139.5–
 9) et 13.11 908b34–909a7 (*BT* p. 139.15–25)

44 ἀλλ' ἡ βαρύτης τοῦ χρώματος *A*: *cruces posui*, *Schn.* i. 4 p. 782 et *Wimm.*
praeuntibus: *om.* *Furl.*: ἀλλ' ἡ βαρύτης τοῦ σώματος *Grang.*: ἀλλ' ἡ βαρύτης
 τοῦ περιττώματος *Coray ap. Schn.* i. 5 p. 174 46 ἦττον (*re vera* ἦττον) *S*:
 ἡγνῶν *A* 47 μάλιστ' *D*: μάλιστ' *A* τῶν ἐν ἡβῃ *A*: *post* τῶν ἐν ἡβῃ *add.*
 τὰ σώματα *Schn.* i. 2 p. 611: οἱ ἐν ἡβῃ *Schn.* i. 5 p. *lix* 47–8 καὶ τῶν πόρων
 ἂν (*c.3 litt. quae legi non possunt*) καὶ μεταβολή *A* (ἄνυξις) *D* (ἄνοιξις) *Grang.*:
 καὶ (ἡ) τῶν πόρων ἄνοιξις, καὶ (ἡ) τῶν χυλῶν) μεταβολή *Schn.* i. 2 p. 611: καὶ
 τῶν πόρων (ἡ) ἄνοιξις καὶ (ἡ) τῶν χυλῶν) μεταβολή *Schn.* i. 5 p. *lix* 49
 κακωδίαν *D*: κακοδίαν *A* *lac.* 8–9 *litt.* *A* 50 μανότητα *D*: (*c. 2 litt.*
incert.) νοσητα *A* εὐπνους *A*: εὐπνοια *Ald.* *ante* διὸ *lac. sign.* *Schn.* 51
 οὔτε *A*: οὐδὲ *Coray ap. Schn.* i. 5 p. 174, cf. p. *lix* 51–2 εὐπνουν (ἔχουσι τὸ
 σῶμα καὶ) ἀπερίττωτον, καὶ οὐδ' (ἐν ἐκκρίν)εται *scripsi, secutus Wimm., qui* καὶ
 (*alt.*) *om.*: ὑπνοῦν *lac.* 7–8 *litt.* ἀπερίττωτον καὶ οὐδ' *lac.* 3–4 *litt.* *εται* *A*: εὐπνουν
 (ποιεῖ τὸ σῶμα καὶ) ἀπερίττωτον, καὶ οὐδ' (ἐν ἐργάζ)εται *Grang.*: εὐπνουν (καὶ)
 ἀπερίττωτον (ἔχουσι τὸ σῶμα,) καὶ οὐδ' (ἐν ἐκκρίν)εται *Schn.* 53 ἄσμος
Furl.: λογισμός *A* *post* ἄσμος *add.* ὁ ἰδρῶς *Schn.* 54 τοῦ (*pr.*) *Schn.*: τὰ
 τ' *A*: τοῦτ' *Furl.* 55 διὰ *A*: *del.* *Grang.*: *forti.* διὰ (τοῦ χρωτὸς *vel* σαρκὸς)
 →

men not at all. † But the heaviness of the color⁵ † and yet the age of adolescents is most capable of concoction. A sign is (the phenomenon) of growth. The (age) of older men is less (capable of growth), and (that) 8 of those already aged entirely (incapable). The explanation (of the difference in odor) is that (the age)⁶ of adolescents is especially driven toward sexual activity, and the pores are open and change (is occurring). All these things contribute to bad odor. The (age) of older men * * * as a certain condition already and permanent. That of aged men on account of rarity (of skin)⁷ also breathes well. Therefore it is also not productive of residue. At the same time (aged men) have a body which both breathes well and is without residue, and there is nothing secreted 9 of the sort from which bad odor might arise. Moreover, on account of this, (sweat) from the head too has no odor, or at least less than that from the body, because the head breathes well. The growth of hairs makes clear * * * the rarity.⁸ But foul odor characterizes a region and what is in it, if it does not breathe well. For there is rotting, and bad odor is a kind of rot. Therefore sweat from the armpits and generally that from cavities have the worst odor. The regions are indeed rare (in texture), but the smothering and concave form produce bad odor. The same thing which affects a region of this sort also generally (affects) the body regarding 10 bad odor. For there too a lack of concoction occurs. We ought to discuss the bad odor (occurring) on account of rue and (caused) by certain myrrh oils, when they give off (such an odor),⁹ for this too happens. And concerning these * * * There also occur hot and cold sweat; the former as

⁵ If we read σώματος with Grangerius, then we might translate: "But the heaviness (of the odor of young people) belongs to the body."

⁶ Different supplements have been proposed; but here and in what follows (8.49–50), it seems reasonable to understand ἡ ἡλικία from above (7.45–6).

⁷ I.e., looseness or openness in the texture of the skin.

⁸ Most likely the lacuna reflects a lost reference to the head (so Grangerius) or to the skin on the head, which is rare in texture.

⁹ If we adopt the reading of Schneider, ἀναδοθῶσι, then the translation would be: "when they (rue and certain myrrh oils) are digested."

lac. c. 3 litt. A: ταύτης suppl. Grang. 55–6 δυσώδης δὲ τόπος καὶ τὰ ἐν αὐτῷ, ᾧ ἂν μὴ εὐπνοία *scripsi, sec. Grang., qui d' (ὁ) ante τόπος coni.:* δυσώδης δὲ τόπος καὶ τὰ ἐν αὐτοῖς· ὥς ἂν μὴ εὐπνοία *A: δυσώδεις δὲ τόποι καὶ τὰ ἐν αὐτοῖς, ὅσα μὴ εὐπνοία Furl. (—(οἱ) τόποι—) Wimm.* 58 κακωδέστατος *B: κακωδέστατος A* 58–9 ἡ κοιλία *Furl., praeunte Grang.:* ποικιλία *A* 60 ὅλως *A: ὅλον Schn.* 61 μύρων *Grang. ex Probl. 2.13 867b9: μυρίων A* 62 ἀναδιδῶσι *Wimm.:* ἀναδίδωσι *A: ἀναδοθῶσι Schn. lac. stat. Schn.*

πεπεμμένος, ὁ δ' ἄπεπτος. ἡ δ' ἀπεψία διαφέρει τῆς εἰς τὴν
κακωδίαν· αὕτη μὲν γὰρ ἔοικε κακεργασία τινὶ καὶ μεταβολῇ 65
† οἷά τις ὑγρότης †· ἐκεῖνο δὲ μεταβολῇ μὲν τινι καὶ ἀλλοιώσει,
οὐ φυσικῇ δὲ οὐδὲ κατακεκρατημένη * * * καθάπερ οὐδὲ τὰ τῆς
κοιλίας περιττώματα δυσώδη.

- 11 Διότιμος δ' ἔλεγεν ὁ γυμναστής ὅτι τρεῖς τινὲς διαφοραὶ τῶν
ιδρώτων εἰσὶν ἀρχομένων τε καὶ μεσούντων καὶ ληγόντων· 70
αὗται μὲν οὖν (αἱ) διαφοραὶ γίνονται τῇ τε τῶν πόνων ἐπιτάσει
καὶ τῇ τοῦ σώματος ἀλλοιώσει. δῆλον γὰρ ὡς ἀπὸ τῆς ἀνομοίας
διαθέσεως ἀνόμοιον καὶ τὸ αἷτιον· ἐπεὶ καὶ λεπτότης τις καὶ
παχύτης ἐστὶν ἐν τοῖς ιδρώσιν· ὁ μὲν γὰρ ἐπιπολαῖος καὶ πρῶτος
ὑδατώδης τις καὶ λεπτός, ὁ δ' ἐκ βάθους μᾶλλον βαρύτερος 75
12 ὥσπερ συντηκομένης τῆς σαρκός. ἤδη δὲ τινὲς φασὶ καὶ αἷματι
εἰκάσθαι, καθάπερ Μονᾶς ἔλεγεν ὁ ἰατρός, δῆλον ὡς ἐπισπασ-
θείσης πλείονος ὑγρότητος ἐκ τῶν φλεβῶν, ἀπέπτου δέ, ὥσπερ
ἀνακεχρωσμένης ταύτης· ἐνίστε γὰρ καὶ αὐτὸ τὸ αἷμα γίνεται
ἄπεπτον. ἀπλῶς δὲ τοῦτό γε ὥσπερ πολλάκις εἴρηται καὶ ἐπὶ 80
πάντων ἐστὶν ἀληθές ὅτι κατὰ τὰς ἕξεις τῶν σωμάτων ἡ
ἔκκρισις αἰὲν τῶν περιττωμάτων γίνεται.
- 13 ἐπεὶ διὰ τοῦτο ἔνιοι ὅταν πλείω πονήσωσιν ἔλκη ἔχουσιν· διὰ
γὰρ τὴν ἀκαθαρσίαν τοῦ σώματος ἡ κίνησις προσοῦσα καὶ θερ-
μαίνουσα συνεξικμάζει τὰ περιττώματα μετὰ τοῦ ιδρώτος, 85
εἴπερ εὖ· ὅτε δὲ παχέα ὄντα καὶ χυμοὺς ἔχοντα μοχθηροὺς, οἷον
ὄξεις καὶ ἀλμυροὺς καὶ πικροὺς, ἐκκρίνεσθαι μὲν οὐ δύναται
διὰ τὸ πλῆθος, ἐξαίρεται δὲ καὶ ἐξελκοῖ τὴν σάρκα διὰ τὴν

83–9 *Probl.* 5.27 883b26–32 (*BT* p. 68.9–15)

64 ἡ δ' ἀπεψία *A*: ἡ δὲ ἀπεψία (αὕτη) *coni. Schn.* t. 4 p. 784 65 κακεργασία
A: κατεργασία *Wimm., praeunte Schn.* t. 4 p. 784 66 οἷά τις ὑγρότης *A*:
cruces posui: τῆς ὑγρότητος *Wimm., praeunte Schn.* t. 4 p. 784 ἐκεῖνο *A*:
ἐκείνη *Grang.* 67 *lac. stat. Wimm.* 71 αἱ *add. Ald.*: *om. A* 72 ἀνομοίας
D: ἀνομίας *A* 73 τὸ *D*: τὸν *A* 74 παχύτης *D*: παχύτις *A* 75 βαρύτερος
A: βαθύτερος *vel* παχύτερος *coni. Furl.* 77 εἰκάσθαι *Schn.* t. 5 p. lix: εἰκάσαι
A 77–8 ἐπισπασθείσης *Furl.*: ἐπισπασθεὶς καὶ *A* 79 ἀνακεχρωσμένης *A*:
ἀνακεχωρισμένης *Grang.* 83 ἔχουσιν *A*: ἐκφύουσι *Forst.*¹ *ex Probl.* 883b26
86 εἴπερ εὖ· ὅτε δὲ *A*: ὑπέρει· ὅτε δὲ *Ald.*: ὑπέρθεν· ὅτε δὲ *Grang.*: ἄπερ
ἐνίστε *Schn.* t. 2 p. 611 παχέα *D*: παχία *A* χυμοὺς *A*: χυλοὺς *Schn.* t.
2 p. 611 *et t.* 5 p. lix 88 πλῆθος, ἐξαίρεται δὲ *scripsi*: πλῆθος, ἐξαίρειται δὲ
A: πάχος, ἐξαίρεται δὲ *Grang. ex Probl.* 883b31

having been concocted and the latter unconcocted. The lack of concoction differs from the (lack resulting) in bad odor. For this¹⁰ is like some bad work and change † as a certain moisture†. And that (is caused) by some change and alteration, but one which is not natural and not controlled¹¹ * * * as neither do the residues of the (intestinal) cavity have a bad odor.

- 11 Diotimus, the trainer, said that there are some three varieties of sweat, beginning, middling and ceasing. Well, these varieties occur through the intensification of exertion and the alteration of the body. For it is clear that, because the condition (of the sweat) is dissimilar, the cause too is dissimilar. (We can say this,) since there is both a certain thinness and thickness in (different varieties of) sweat, for the superficial and first (variety) is one which is watery and thin, and the (variety coming) from deeper within is heavier as when there is colliquescence of the
- 12 flesh. Some say that it has already taken on the appearance of blood, as Monas the doctor said, clearly since more moisture was drawn from the vessels, but unconcocted, this (moisture) being, as it were, (slightly) colored. For sometimes also blood itself occurs unconcocted. This at least is generally the case, as has been stated often,¹² and it is true in all cases that the secretion of residues always occurs in accordance with the (different) states of the body.
- 13 Moreover, on account of this some men have ulcers, when they have overly exerted themselves. For on account of the impurity of the body, the motion, which is additional and a source of heat, causes the residues to exude together with the sweat, if (the process goes) well; but when (the residues) are thick and contain bad juices, like (those which are) acidic and salty and bitter, (then the residues) cannot be secreted on account of the quantity, but rise up and cause the flesh to ulcerate on

¹⁰ Apparently, the lack of concoction which results in bad odor. But throughout this section, the text is quite uncertain.

¹¹ If *κατεργασία* is emended to read *κατεργασίᾳ*, if *οἷά τις ὑγρότης* is changed to *τῆς ὑγρότητος*, and if *ἐκεῖνο* becomes *ἐκείνη* (10.65–6), then we might translate: “For this (the lack of concoction resulting in cold sweat) is like some working up and change of the moisture; and that (lack which results in bad odor is like) some change and alteration, but one which is not natural and not controlled.”

¹² Especially in sections 5, 6 and 11.

- 14 πικρότητα τοῦ χυμοῦ. παραπλήσιον δὲ τρόπον τινὰ τούτῳ καὶ τὸ
περὶ τὴν ψώραν καὶ τοὺς λειχήνας καὶ λέπραν καὶ ὅλως ὅσα 90
ἐκφύματα γίνεται· καὶ γὰρ ἐν τούτοις ἀπέπτου τινὸς χυμοῦ καὶ
περιττώματος ἔκκρισις τὸ ἐπιπολῆς ἐστὶν † ὧν σπειρῶνται καὶ
δεῖν κατ' ἄλλον τρόπον † ἀντισπῶντας καὶ ἀντικαθιστάντας
παῦλάν τινα ποιεῖν. ἀλλὰ περὶ μὲν τούτων καὶ πόσα καὶ ποῖα
15 καὶ τί διαφέροντα * * * καθ' αὐτὰ χρή θεωρεῖν. ὅτι δὲ διὰ 95
καχεξίαν τινὰ καὶ ἡ τῶν τοιούτων ἔκκρισις φανερόν ἐκ τῶν
εἰρημένων· οὐ γὰρ ὅτι ταῦτα πόνου προσδεῖται καὶ τῆς ἔξωθεν
κινήσεως, ἀλλὰ τὰ δι' αὐτῶν διωθεῖται ὑπὸ τῶν κρατούντων·
συμβαίνει γὰρ τὰ μὲν τῇ ὥρᾳ διακρινόμενα τὰ δ' ἐν κινήσει καὶ
τῇ ἐκ ταύτης θερμότητι ποιεῖσθαι τὴν ἔκκρισιν, τὰ δ' ἤδη διὰ 100
πλήθος ἀεὶ αὐτῶν ἢ τοῦ αἰτίου γέ τι χυλοῦ καθ' ἕκαστον. ὅτι δὲ
κινήσεις καὶ οἱ πόνοι ποιοῦσιν ἐνίοις τὰ τοιαῦτα φανερόν καὶ ἐκ
τῶν ἐνοδίων καλουμένων, ἃ γίνεται πολλοῖς ὅταν εἰς ὁδὸν
ἐμπέσωσι, μάλιστα μὲν ἐπὶ τοὺς μη(ρούς) ὅτε δὲ καὶ ἐπὶ πλεῖον·
16 ἔστι δ' οἷς καὶ αἱ κνήμαι παραπίμπρυνται. πρὸς ἅπαντα δὲ 105
τοιαῦτα συμφέρει τὸ μὴ ἐρεθίζειν μηδὲ κινεῖν ἄλλ' ἔάν ἀπο-
καταστήναι· συνεκκαλεῖσθαι γὰρ ἐστὶ κινεῖν τὴν ὁρμήν,
ὅπερ καὶ πρὸς τὰ ἐξαιρόμενα συμβαίνει. πολλάκις γὰρ διὰ τὴν
ἀλμυρίδα τὴν ἀπὸ τοῦ ἰδρώτος γινομένην (ἐρεθισ)μῷ τινὶ
κνησμῶδει καὶ ἐπάρσεις τινὲς ἰονθῶδεις γίνονται πρὸς ἃς οὐ 110
συμφέρει τὸ κινεῖν, οὔτε ταύτῃ ποιοῦμενον τὴν ἔκκρισιν οὔτε

89 χυμοῦ A: χυλοῦ Schn. i. 2 p. 611 et i. 5 p. lix 91 χυμοῦ A: χυλοῦ Schn. i. 2 p. 611 et i. 5 p. lix 92 ἐπιπολῆς V^a: ἐπιπολλῆς A 92-3 cruces posui
92 σπειρῶνται A: πειρῶνται Ald. καὶ δεῖν A: καὶ δὴ Ald.: καθάρσει Wimm.
93 τρόπον A: τόπον Wimm. ἀντισπῶντας καὶ ἀντικαθιστάντας A: ἀντι-
σπῶντες καὶ ἀντικαθιστάντες Furl. 95 lac. c. 12 litt. ante καθ' αὐτὰ A:
αὐτὰ καθ' αὐτὰ Grang.: sine lac. R 98 τὰ δι' αὐτῶν R: τὰ δι' αὐτῶν A: τὰ
μὲν αὐτῶν Furl.: καὶ τιν' αὐτῶν Schn. i. 2 p. 611: τινα δι' αὐτῶν Sharples
99 διακρινόμενα A: κρινόμενα Ald. 100 θερμότητι B: θερμότητα A:
θερμότητος H 101 ἀεὶ αὐτῶν A: ἀπέπτων Schn. i. 2 p. 612: περιττωμάτων
Schn. i. 5 p. lix, qui i. 4 p. 786 ad Furl. spectat γέ τι A: γ' ἔτι Schn. i. 2 p. 612
et i. 5 p. lix χυλοῦ A, sed vid. v. 86, 89, 91 102 ἐνίοις D: ἐνιοι A 104
μη(ρούς) Furl.: μεῖ et lac. c. 4 litt. A: μεῖ(ον ὁδεύειν εἰωθότας) Grang. 104-
5 πλεῖον· ἔστι δ' οἷς ali. manu supra lin. B: πλοῖον· ἔστι δ' οἷς (vel αἷς ex οἷς
Burnikel p. 86) A: πλεῖον· ἔστι δ' αἷς D 107 συνεκκαλεῖσθαι Schn.:
συνεγκαλεῖσθαι A 108 γὰρ A: δὲ S 109 (ἐρεθισ)μῷ Furl.: lac. c. 4 litt.
ante μῷ A: (ὑπὲρ χυ)μῷ Grang. 110 κνησμῶδει A: κνισμῶδει D. 111 τὸ
Grang.: τοῦ A ταύτῃ ποιοῦμενον A: ἄλλως παύοντα dubitanter coni.
Wimm.¹ p. xxvi et ² p. xxi

14 account of the bitterness of the juice. In a manner similar to this (arise) also scab and scurvy and leprosy and generally all the eruptions which occur. For in these too what develops on the surface is a secretion of some unconcocted juice and residue † of which they are coiled and to be necessary in another manner † by causing diversion and effecting a settling down to produce some cessation (of the eruptions).¹³ But concerning these (eruptions), how many are they and of what sort and how do
 15 they differ * * * one ought to consider (them) in themselves. It is clear from what has been said that the secretion of such (residues) too occurs on account of some bad condition (of body). For not only do these (residues) need the addition of exertion and external motion, but the (residues which erupt) of themselves¹⁴ are driven through (the skin) by the dominant elements (within). For it happens that (residues) effect secretion, in some cases when the (residues) are separated because of adolescence, and in other cases (when separation occurs) during motion and through the heat resulting from it, and in others now on account of the quantity of these (residues) on each occasion or of the juice which is a cause at least in a way in each case. It is clear also from the so-called road sores that motions and exertions produce in some men such (eruptions). They arise in many when they take to the road; (they occur) especially on the thighs and sometimes on a larger area. In some men the
 16 shins too are enflamed. In regard to all such (eruptions), it is beneficial not to irritate and not to move (them), but to allow (them) to settle down. For (to do otherwise) is to call forth the (internal) drive by moving (them), which is what happens also in regard to the (residues) which rise up.¹⁵ For often on account of the salty fluid which comes from sweat, some irritation of a scratching kind also causes some pimply swellings. In regard to these, it is not beneficial to move (the swellings), neither producing in this way the secretion (of fluid), nor trying to hold

¹³ If we adopt the following emended text: ὧν πειρῶνται καὶ δὴ κατ' ἄλλον τόπον ἀντισπῶντες καὶ ἀντικαθιστάντες παῦλάν τινα ποιεῖν, then we might translate: "of which they try to produce some cessation especially by causing diversion to another place (i.e. revulsion) and by effecting a settling down."

¹⁴ If we follow Schneider, vol. 2 p. 611, and read ἀλλὰ καὶ τιν' αὐτῶν, then we might translate: "but also some of them."

¹⁵ I.e., in regard to the pimply swellings discussed in what follows.

- δριμύτητι χυλῶν οἶον ὀξεῖ καὶ στρυφνῷ καὶ (ἀ)λυκῷ κατέχειν
 πειρώμενον οὐδὲ θερμολουσίαις ἢ ψυχρολουσίαις χρώμενον,
 ἀλλὰ περικλύσει χλιαρᾷ μὴ πολλῇ. καθίστησι γὰρ αὕτη μάλ-
 17 ιστα, τᾶλλα δ' ἐρεθίζει καὶ κινεῖ. ταῦτα μὲν οὖν ὥσπερ εἴρηται 115
 διὰ καχεξίαν καὶ δι' ὑπερβολὴν ἐνίοτε πόνων γίνεται· καὶ γὰρ
 ἐνταῦθα συμμετρία τίς ἐστι τῆς ἐκκρίσεως ὥσπερ καὶ κατὰ τοὺς
 ἄλλους πόνους. οἱ δ' ἄγαν ἐνδιδόντες ἑαυτοὺς ὥσπερ συντήκ-
 18 ουσι τοῦτο ποιοῦσιν, ὡς Ἀντιφάνης ὁ Δήλιος καὶ Ὑριάδας. 120
 διὰ τί δ' οἱ παῖδες δυσίδρωτες τῶν ἀνδρῶν μᾶλλον καὶ
 μάλιστα δὴ τὰ παιδία καίπερ θερμὰ τὴν φύσιν ὄντα καὶ ὑγρὰ
 καὶ τοῦ ιδρώτος ἐκ τούτου πως γινομένου, τήνδε τὴν αἰτίαν
 ὑποληπτέον, ὅτι πυκνὸς ὁ χρῶς τῶν παίδων, πυκνότατος δ' ὁ τῶν
 19 παιδίων, ὥσπερ συγκεκλειμένους ἔχων τοὺς πόρους. ἔτι δ' ἡ 125
 θερμότης ἐπικρατοῦσα πέττει διὰ τὴν αὔξησιν· ἐὰν δέ τι καὶ
 γίνηται περίττωμα τοῦτο ἐκκρίνεται κατὰ κοιλίαν· εὐρους γὰρ
 καὶ ὡς ἐπίπαν ὑγροτέρα (ἢ) τῶν παιδίων, οἱ δὲ γέροντες
 μανόχροοι μὲν, ἀλλὰ ξηροί. δεῖ δὲ τῷ ιδρώτι καθάπερ ὕλην τινὰ

120–31, 133–5 *Phot.* 278 528b37–529a9 (*CB t.* 8 p. 167.24–168.8) ὅτι οἱ παῖδες τῶν ἀνδρῶν μᾶλλον δυσίδρωτες, καὶ μάλιστα τὰ παιδία, καίτοι τὴν φύσιν ὄντα θερμὰ καὶ ὑγρὰ, ἐξ ὧν ἡ τῶν ιδρώτων γένεσις, διότι πυκνότατοι τῶν παίδων οἱ χρώτες καὶ ὥσπερ συγκεκλεισμένοι. ἔτι δὲ ἡ θερμότης ἐπικρατοῦσα πέττει διὰ τὴν αὔξησιν· ἐὰν δέ τι καὶ γένηται περίττωμα, τοῦτο ἐκκρίνεται κατὰ κοιλίαν· εὐρους γὰρ ὡς ἐπίπαν ἡ τῶν παίδων (*B:* παιδίων *M*), οἱ δὲ γέροντες μανόχροες μὲν, ἀλλὰ ξηροί· δεῖ δὲ τῷ ιδρώτι καθάπερ ὕλην ὑπάρχειν τὸ ὑγρὸν· ἄλλως τε δὲ καὶ αὐτὸ τὸ εὐπνουν καὶ μανὸν ἱκανὴν τὴν ἐκκρίσιν ποιεῖ, καὶ τῷ συνεχῶς γίνεσθαι καὶ τῷ μὴ πολλὰ ἐνυπάρχειν τὰ ὑγρά. διὰ τοῦτο καὶ ὧν αἱ κοιλίαι ὑγραὶ καὶ εἰς κύστιν ἢ ἐπιρροὴ τοῦ περιττώματος οὐκ εὐίδρωτες γίνονται (*B: om.* γίνονται *M*), διότι πᾶν τὸ ὑγρὸν ἐνταῦθα ὥρμησεν·

112 ἀλυκῷ *alt. manu mg. B: lac. c. 2 litt. ante λικῷ A* 113 θερμολουσίαις ἢ ψυχρολουσίαις *alt. manu supra lin. B: θερμολουσίας ἢ ψυχρολουσίας ἢ ψυχρολουσίας A (sine tert. membr.) D: θερμολουσίᾳ ἢ ψυχρολουσίᾳ Furl.* 114 περικλύσει *LSJ s.v. p. 1377: περικαύσει A: πυριάσει Coray ap. Schn. t. 5 p. 174* αὕτη *B: αὐτὴ (sic) A: αὐτὴ Grang.* 118 πόνους *Grang.: πόρους A* 118–19 ἐνδιδόντες ἑαυτοὺς ὥσπερ συντήκουσι τοῦτο ποιοῦσιν *Schn.: ἐνδ.—συντίκτουσι—ποιοῦσιν A: ἐνδιδόντες τοῦτο ποιοῦσιν, ἑαυτοὺς ὥσπερ συντήκουσι Grang.* 119 ὡς *Grang.: ἄς A* 121 καίπερ *alt. manu mg. B: καθάπερ A: fort. καίτοι ex Phot. 528b38* 122 τούτου *A: τούτων Schn. t. 4 p. 787* 123–4 παίδων ... παιδίων *Grang.: παιδίων ... παίδων A* 124 ὥσπερ συγκεκλειμένους *Schn. t. 2 p. 612 et t. 5 p. lix, qui t. 4 p. 787 ad Phot. 528b40–1 spect.: ὥσπερ νῦν κεκλιμένους A: ὥσπερ νῦν κεκλειμένους B: ὥσπερ γυναικῶν, κεκλεισμένους Grang.* ἔχων *alt. manu supra lin. B: ἔχον A* 126 εὐρους *Grang.: εὐροα A* 127 ἢ *suppl. Schn. ex Phot. 529a2: om. A: τὰ S*

- down (the swellings) by pungent juices, like acidic and astringent and salty (juices), nor using hot and cold water treatments, but a mild and limited douche.¹⁶ For this (kind of treatment) has a special settling effect, but the other (treatments) produce irritation and motion. These things, therefore, as has been said, occur on account of a bad condition (of body) and sometimes on account of excessive exertion. For here too there is a balance of secretion, as also in the other (cases of) exertion. Those who apply themselves too much, just as they cause colliquescence, produce this,¹⁷ as (did) Antiphanes, the Delian, and Hyriadas.
- 18 Why do children have greater difficulty sweating than men, and especially young children although they are in their nature hot and moist, and sweat in a way arises from this (condition)? The following cause must be assumed: namely, that the skin of children is dense, and that of young children very dense, having pores which are, as it were, closed
- 19 up. Furthermore, the heat (of young children), being dominant, concocts for the sake of growth. If any residue does occur, it is secreted through the intestines, for the (intestines) of young children are characterized by an easy flow and on the whole are rather moist. Aged men are characterized by rarity of skin, but they are dry. For sweat it is necessary

120–31, 133–5 Phot. 278 528b35–529a9 (CB vol. 8 p. 167.24–168.8) (I read) that children have greater difficulty sweating than men and especially young children, even though they are in their nature warm and moist, and from these (warmth and moisture) sweat arises. The reason is that the skin of children is very dense and as it were closed shut. Furthermore, the heat, being dominant, concocts for the sake of growth. If any residue does occur, it is secreted through the intestines, for on the whole the (intestines) of children are characterized by easy flow. Aged men are characterized by rarity of skin, but they are dry. For sweat it is necessary that moisture be present as material. Above all, the ease of breathing and rarity (of skin of aged men) make the secretion sufficient, both because it is continuous and because not much moisture is present. On account of this, ease in sweating does not characterize those whose intestines are moist and (for whom) there is flow of residue into the bladder, because all moisture has tended to these places.

¹⁶ If we read *περικαύσει* with codex A, then Theophrastus is recommending cauterization. The conjecture of Coray, *πυρίάσει*, has Theophrastus recommending a vapor bath.

¹⁷ I.e., the phenomenon of eruption.

- ὑπάρχειν· ἄλλως τε καὶ αὐτὸ τὸ εὕπνου καὶ μανὸν ἱκανὴν
 ποιεῖ τὴν ἔκκρισιν αἰεὶ τε συνεχὲς ὄν καὶ μὴ πολλῶν ἐνυπαρ- 130
 χόντων. ὥστε πλείων ἢ ξηρότης καὶ τὸ μὴ εὐΐδρον· ἢ γὰρ κατ'
 ἄλλον τρόπον ἀπέρασις ἢ κατὰ τὸν αὐτόν, ἑκάτερα (δὲ) κωλύει
 20 τοὺς ἰδρῶτας. διὰ τοῦτο γὰρ καὶ ὧν αἱ κοιλίαι ὑγραὶ καὶ οἷς εἰς
 κύστιν ἢ ἐπίρροια πλείων δυσΐδρωτες ὅτι πᾶν τὸ ὑγρὸν ἐνταῦθ'
 ὥρμηκεν· οἷς δὲ πάλιν ἐπίσχεται τὸ τῆς κοιλίας καὶ κύστεως 135
 οὔτοι δὲ εὐΐδρωτες μᾶλλον. ἢ γὰρ ἐνταῦθα μεριζομένη περίτ-
 τωσις ἀναφέρεται πρὸς τὰς σάρκας καὶ εἰς τοὺς ἄνω τόπους·
 ἐπεὶ καὶ ἀπέπτων τῶν σιτιῶν ὄντων καὶ ἀγρυπνήσαντες
 εὐΐδρωτες μᾶλλον, ὅτι συμβαίνει τὴν πέψιν διαμερίζειν τὴν
 ὑγρότητα καὶ τὸν ὕπνον ἐκπέττειν· ἐκ ξηροῦ δ' οὐκ ἔστιν ἰδρῶς. 140
 21 ἄτοπον δ' ἂν ἐκεῖνο δόξειε καὶ ὥσπερ ὑπεναντίον εἰ (οἱ) γυμνα-
 ζόμενοι καὶ εὖ ἔχοντες εὐΐδρωτες καὶ πάλιν οἱ ἀγύμναστοι (καὶ)
 κακῶς (ἔχοντες) καὶ (οἱ) πεπεμμένην δὲ καὶ ἄπεπτον ἔχοντες τὴν
 τροφήν. οὐκ ἔστι δ' ἄτοπον· (οἱ γὰρ) γεγυμνασμένοι τῷ μανὰ τὰ
 σώματα καὶ ἀνεωγμένους ἔχειν τοὺς πόρους, ἔτι δὲ (τῷ συνήθεις 145

138–40 *Phot.* 278 529a10–11 (*CB T.* 8 p. 168.9–11) ὅτι οἱ μὴ πέσαντες τὰ σιτία καὶ οἱ ἀγρυπνήσαντες εὐΐδρωτες, διότι ἡ πέψις διαμερίζει (*B*: μερίζει *M*) τὴν ὑγρότητα καὶ ὁ ὕπνος πέττει. 141–54 *Phot.* 278 529a12–22 (*CB t.* 8 p. 168.12–22) ὅτι οἱ γυμναζόμενοι καὶ εὖ ἔχοντες εὐΐδρωτες μᾶλλον τῶν ἀγυμνάστων. ὅτι καὶ οἱ πεπεμμένην καὶ οἱ ἄπεπτον ἔχοντες τὴν τροφήν εὐΐδρωτες· καίτοι δόξει ἄτοπον εἶναι, οὐκ ἔστι δέ. οἱ μὲν γὰρ γεγυμνασμένοι τῷ μανὰ τὰ σώματα ἔχειν καὶ ἀνεωγμένους τοὺς πόρους, καὶ τῷ συνήθεις εἶναι πρὸς τοὺς ἰδρῶτας, εὐΐδρωτες· τῶν δὲ μεμύκασιν οἱ πόροι διὰ τὸ μὴ χρῆσθαι. οἱ δὲ μὴ πεπεμμένην ἔχοντες τὴν τροφήν τῷ πλήθει τῆς ὑγρότητος εὐΐδρωτες· οἱ δὲ πεπεμμένην τῷ τὴν ὑγρότητα διακεκρίσθαι τῇ πέψει τοῦ ἄλλου χυλοῦ ῥαδίαν ἔχουσι τὴν ἐξόρμησιν.

129 *post* ὑπάρχειν *suppl.* τὸ ὑγρὸν *Schn. ex Phot.* 529a4 ἄλλως τε καὶ αὐτὸ τὸ *Schn. ex Phot.* 529a4–5: ἄλλα δὲ καὶ αὐτὸ τοῦτο *A*: ἄλλως δὲ καὶ αὐτὸ τὸ *Furl.* 130–1 *post* ἐνυπαρχόντων *suppl.* τῶν ὑγρῶν *Schn. ex Phot.* 529a7 131 πλείων *Grang.*: πλείονων *A* 131–2 ἢ ... ἢ *Schn. t.* 2 p. 612: ἢ ... ἢ *A* 132 δὲ *suppl. Schn. t.* 2 p. 612 *et t.* 5 p. lix 133 οἷς *A*: *om. Ald.* 134 ἢ ἐπίρροια πλείων δυσΐδρωτες *Schn.*: ἢ ἐπίρροια πλείω δ' οἱ ἰδρῶτες *A*: ἢ ἐπίρροια πλείον δυσΐδρωτες *Furl.* 135 ἐπίσχεται τὸ *Schn.*: ἐπίσχεται τὰ *Furl.*: ἐπὶ τὰ σίτα *A* 140 ἐκπέττειν *Schn. praeunte Grang.*: ἐκπέμπειν *A* 141 εἰ *O*: ἢ *A* οἱ *suppl. Ald.*: *om. A* 142 εὖ ἔχοντες εὐΐδρωτες *Grang. ex Phot.* 529a12–13: συνέχοντες ἰδρῶτες *A* 142–4 οἱ ἀγύμναστοι (καὶ) κακῶς (ἔχοντες) καὶ (οἱ) πεπεμμένην δὲ καὶ ἄπεπτον ἔχοντες τὴν τροφήν *Furl.* (τε καὶ (οἱ) ἄπεπτον) *Schn. t.* 2 p. 612 *et* 5 p. lix, *qui ad Phot.* 529a13–14 *spect.*: οἱ ἀγύμναστοι κακῶς καὶ πεπεμμένην δὲ καὶ ἄπεπτον ἔχοντες τὴν τροφήν *A* 144 οἱ γὰρ *suppl. Furl.*: *lac. c.* 6 *litt. A*: οἱ μὲν γὰρ *suppl. Burn. ex Phot.* 529a15 →

that (moisture) be present as a material. Above all, the ease of breathing and rarity (of skin of aged men) make the secretion sufficient, (the breathing) being ever continuous and there not being much (moisture) present. As a result, the dryness is greater and there is no ease of sweating.¹⁸ For either there is a carrying off (of moisture) in another way or in
 20 the same (as now discussed), and each prevents sweating. For on account of this, difficulty in sweating characterizes both those whose intestines are moist and those for whom there is a greater flow (of moisture) into the bladder, because all moisture has tended towards these places. Again, those persons sweat more easily, for whom there is a hinderance of the intestines and bladder. For the residue which is (normally) distributed to these places is carried up to the flesh and the regions above. Moreover, both when food is unconcocted and men go sleepless, they sweat more easily, because it happens that concoction distributes moisture and sleep thoroughly concocts; and from dryness
 21 there is no sweat. It would seem odd and, as it were, contrary if those who exercise themselves and are in good condition sweat easily, and again those who are non-exercisers and are in bad condition (sweat easily), and those who have food concocted and (those who have it) unconcocted (do so). But it is not odd, for those who have exercised themselves (sweat easily) because their bodies are rare (in texture) and they have open pores, and further because they are habituated with re-

138–40 Phot. 278 529a10–11 (CB vol. 8 p. 168.9–11) (I read) that men who fail to concoct food and who go sleepless sweat easily because concoction distributes moisture and sleep concocts. 141–54 Phot. 278 529a12–22 (CB vol. 8 p. 168.12–22) (I read) that those who exercise themselves and are in good condition sweat more easily than those who do not take exercise. (I read) that those who have food concocted and those who have it unconcocted sweat easily. And yet (that) will seem to be strange, but it is not. For these who have exercised themselves sweat easily because they have bodies rare (in texture) and pores which are open, and because they are habituated with regard to sweat. Of the others, the pores have been closed on account of not being used. Those who have unconcocted food sweat easily because of the quantity of moisture. Those who (have it) concocted have a ready tendency to exude (sweat) because moisture has been separated out by the concoction of the rest of the juice.

¹⁸ Or “no readiness to sweat.”

τῷ μανᾷ *Schn. ex Phot. 529a16*: τῶν ἀνὰ A: μανὰ *Grang.* 145 ἔχειν τοὺς πόρους *Schn. ex Phot. 529a15–16*: ἔχοντες πόρους A 145–6 ἔτι δὲ (τῷ συνήθεις εἶναι πρὸς) *Schn., qui verba suppl. ex Phot. 529a17*: ἔχει δὲ *et lac. c. 12 lit. A*: ἔχουσι πολλοὺς *Furl.*

- 22 εἶναι πρὸς) τοὺς ἰδρῶτας. διὰ τοῦτο γὰρ καὶ οἱ μὲν χρονίως
 ποιούμενοι τὰς ἀφιδρώσεις εὐί(δρωτες) * * * ὅτι τῶν μὲν ἀνεωγ-
 μένοι τῶν δὲ συμμαρυκότες οἱ πόροι διὰ τὸ μὴ χρῆσθαι.
 συμβαίνει δὲ τούτοις καταπεπεμμένης τῆς τροφῆς διὰ τὴν αὐτὴν
 αἰτίαν· οἱ δὲ κακῶς ἔχοντες καὶ μὴ πεπεμμένην τὴν τροφήν τῷ 150
 πλήθει τῆς ὑγρότητος εὐίδρωτες, διότι οὗτ' ἀπὸ τῶν αὐτῶν οὕθ'
 ὡσαύτως. ἀλλ' ἐκεῖνοι μὲν μετὰ πόνου καὶ ἀεὶ τὸ σύμμετρον
 ἀφαιροῦντες, οὗτοι δὲ καὶ αὐτομάτως καὶ ὡς ἂν τύχη καὶ τὸ ὅλον
 23 ἀεὶ περιττώματος ἔχοντες πλήθος. δοκοῦσι δέ τινες καὶ ἐν τῷ
 χειμῶνι μᾶλλον εὐίδρωτες (ἢ) ἐν τῷ θέρει εἶναι, μὴ τὰς 155
 ὑπερβολὰς ἐκατέρου λαμβανόντων—οἷον ψύχους τε καὶ
 καύματος, ἢ μὲν γὰρ οἷον ῥίγος ἂν ποιήσειεν, ἢ δὲ τοῦ καύματος
 σύντηξιν—ἀλλὰ τὸ μέσον ἐν ἐκατέρῳ. τὴν δ' αἰτίαν ταύτην
 ὑποληπτέον, εἴπερ ἀληθές, ὅτι ἢ μὲν ξηρὰ τῶν ὑγρῶν, ἢ δὲ ψυχρὰ
 ἀντιπερίστασιν τινὰ τοῦ θερμοῦ (ποιεῖ) καὶ κατάστασιν. ὁ δὲ 160
 ἰδρῶς ἐξ ἀμφοῖν, τοῦ μὲν ὡς ποιοῦντος τοῦ δὲ ὡς πάσχοντος. ἔτι
 δὲ τοῦ θέρους καὶ διαιτῆσονται τὸ πολὺ τοῦ ὑγροῦ.
- 24 διότι δὲ καὶ (τὰ) ἄνω μᾶλλον ἰδρῶσι τρόπον τινὰ φανερόν· καὶ
 γὰρ τὸ ὑγρὸν καὶ τὸ πνεῦμα καὶ τὸ θερμὸν ἐνταῦθα μᾶλλον, ἐξ ὧν
 καὶ δι' ὧν ὁ ἰδρῶς. 165

146–8 *Probl.* 2.8 867a12–17 (*BT* p. 21.20–5) 161–2 *Probl.* 2.40 870b10–13
 (*BT* p. 30.25–31.2) 163–5 *Probl.* 2.4 866b28–32 (*BT* p. 20.24–21.3)

146 *post* τοὺς ἰδρῶτας *add.* εὐίδρωτες *Schn.* *ex Phot.* 529a18: *nulla lac.* A μὲν
 A: μὴ *Grang.*: μὲν (μὴ) *Burn.* p. 140 *et* 152, *qui ad Probl.* 867a12 *spect.* 147
 εὐί(δρωτες) * * * ὅτι *scripsi*: εὐί *lac.* 8 *lit.* ἔτι A: εὐί(δρωτες). ἔτι *Furl.*: εὐί(δρωτες),
 ὅτι *Schn.*: εὐί(δρωτες, οἱ δὲ χρονίως οὐχ), ὅτι *Burn.* p. 140 *et* 152: *fort.* εὐί(δρωτες,
 οἱ δὲ μὴ, οὐχ), ὅτι 149 τούτοις καταπεπεμμένης τῆς τροφῆς (*re vera* κατὰ
 πεπεμμένης) A: τοῦτο τοῖς ἔχουσι πεπεμμένην τὴν τροφήν *Schn.* t. 2 p. 612:
 τοῦτο τοῖς καταπεπεμμένην τὴν τροφήν (ἔχουσι) t. 5 p. lix: τὸ αὐτὸ τοῖς
 καταπεπεμμένην τὴν τροφήν (ἔχουσι) *Schn.* t. 4 p. 789, *qui ad versionem Furl.* p.
 235 *spectat*: τοῦτο καὶ καταπεπεμμένης τῆς τροφῆς *Burn.* p. 138 *et* 152 150
post καὶ μὴ *lac.* c. 25 *lit.* V πεπεμμένην *alt. manu mg.* B: πεπηγμένην A
 155 ἢ *V^a*: *lac.* 1 *lit.* A 158 σύντηξιν O: σύντηξις A 159–60 ὅτι ἢ μὲν ξηρὰ
 τῶν ὑγρῶν, ἢ δὲ ψυχρὰ ἀντιπερίστασιν τινὰ τοῦ θερμοῦ (ποιεῖ) *Wimm., secutus*
Schn., qui ὥρα post ξηρὰ *suppl.*: ὅτι ἢ μὲν ξηρὰ τῶν ὑγρῶν· ἢ δὲ ὑγρὰ εἶναι
 περίστασιν τινὰ τοῦ θερμοῦ A: ὅτι τὰ μὲν ξηρὰ τῶν ὑγρῶν, τὰ δὲ ψυχρὰ εἶναι
 περίστασιν τινὰ τοῦ θερμοῦ *Grang.*: ὅτι ἢ μὲν ξηρὰ, τῶν ὑγρῶν· ἢ δὲ ὑγρὰ (τῶν
 ξηρῶν) εἶναι περίστασιν τινὰ τοῦ θερμοῦ *Furl.* 160 κατάστασιν A: κατὰ-
 ληψιν *Burn.* p. 153, *qui ad Probl.* 870b11 *spect.* 162 διαιτῆσονται A:
 διαιτῶνται *Furl.*: διατήκεται *Grang.*: διατήσονται *Schn., qui* t. 2 p. 612 *suam*
coniecturam respuit ante τοῦ ὑγροῦ *add.* ἀπὸ *Burn.* p. 154 163 (τὰ) ἄνω
 μᾶλλον *Schn.* t. 4 p. 790 *ex Probl.* 866b28: ἀνώμαλον A

- 22 gard to sweat. For on this account those too who for long periods engage in sweating-off ¹⁹ sweat easily * * * ²⁰ because the pores of the one group have been opened, and (those) of the other closed up on account of not being used. It happens to these, ²¹ when food has been concocted, on account of the same cause. Those who are in bad condition and have unconcocted food sweat easily because of the quantity of moisture, since (men sweat) neither from the same (causes) nor in the same way. But those (who exercise themselves sweat) with exertion and (in doing so are) always removing what is proportionate, while these (in bad condition sweat) automatically ²² and as may happen and generally having
- 23 at all times a quantity of residue. Some men seem to sweat more easily even in the winter than in summer, assuming no excesses of each—i.e., of cold and heat, for the (excess of cold) would produce for instance shivering and the (excess) of heat colliquescence—but moderation in each. If (this) is true, the following explanation must be assumed: that the dry (weather of summer produces a certain concentration) of moisture, and the cold (weather of winter) produces a certain concentration of heat and (therefore) a condition (conducive to sweating). Sweat results from both, the one as acting and the other as being affected. Furthermore, during the summer men will consume much that is moist. ²³
- 24 Why men sweat more also on the upper (parts of the body) is in a way clear. For here there is more of the moisture and the breath and the heat from which and through which sweat occurs.

¹⁹ The reference is to persons who take long vapor baths thereby opening their pores and sweating.

²⁰ In the context of the text as printed, the lacuna will have contained words saying that those who fail to engage in long periods of sweating-off do not sweat easily.

²¹ I.e., to men who exercise and are in good condition.

²² I.e., without special exercise or exertion.

²³ Schneider vol. 2 p. 612 suggests that this sentence is a remnant of a new problem.

- 25 καὶ οὐδ'οἱ πονοῦντες ἀλλ' ὅταν παύσωνται μᾶλλον ἰδρῶσιν, οὐδὲ συντείνοντες οὐδὲ κατέχοντες τὸ πνεῦμα, ἀλλ' ὅταν ἀνῶσιν, ἐν τούτοις ἡ αἰτία· πονούντων μὲν γὰρ ὑπὸ τοῦ πνεύματος αἱ φλέβες ἐμφυσώμεναι συμμύειν ποιοῦσι τοὺς πόρους, παυσαμένων δὲ συνίζουσιν ὥστε δι' εὐρυτέρων καθά- 170
περ ἀνεφωγμένων μᾶλλον ἐξέρχεται τὸ ὑγρόν. καὶ ἡ κάθεξις δὲ τοῦ πνεύματος πληροὶ τὰς φλέβας ὥστε κωλύει διιέναι καθάπερ τὸ ὕδωρ τὸ ἐκ τῶν κλεψύδρων, ὅταν γε πλήρεις οὔσας τις ἐπιλάβῃ· ὅταν δ' ἀνεθῇ τότε ἐξέρχεται μηδενὸς ἐμφράττοντος.
- 26 (ἔπει)τα δὲ καὶ ἡ ἀπόκρισις ἡ ὑπὸ τῆς θερμότητος γινομένη διὰ 175
τῶν πόρων ἐκ τοῦ ὑγροῦ πνεύματος † ἡ καὶ ἄγει † πρὸς τὸ ἐπιπολῆς· ὅταν δὲ παύσῃται πονῶν ἢ τε θερμότης ἅμα λήγει καὶ ἐκ τοῦ πνεύματος ἀποψυχομένου γίνεται ὑγρότης ὁ καλούμενος ἰδρῶς, ὥστε καὶ πλεῖον καὶ ῥᾶον ἐκπίπτειν.

166–72 *Phot.* 278 529a22–8 (*CB t.* 8 p. 168.23–9) ὅτι οὐ πονοῦντες, ἀλλ' ὅταν παύωνται μᾶλλον ἰδρῶσιν, οὐδὲ συντείνοντες οὐδὲ κατέχοντες τὸ πνεῦμα, ἀλλ' ὅταν ἀνῶσι, διότι πονούντων μὲν ὑπὸ τοῦ πνεύματος αἱ φλέβες ἐμφυσώμεναι συμμύειν ποιοῦσι τοὺς πόρους, ὥστε δι' εὐρυτέρων μᾶλλον ἐξέρχεται τὸ ὑγρόν. καὶ ἡ κάθεξις δὲ τοῦ πνεύματος πληροὶ τὰς φλέβας, ὥστε κωλύει διιέναι

166–74 *Probl.* 2.1 866b9–14 (*BT p.* 20.5–10) 166–72 *Probl.* 2.23 868b12–17 (*BT p.* 25.20–5) 166–71 *Probl.* 2.20 868a15–20 (*BT p.* 24.13–18) 172–4 *Probl.* 2.24 868b20–8 (*BT p.* 25.28–26.7) 175–9 *Probl.* 2.20 868a20–5 (*BT p.* 24.18–23)

166 καὶ οὐδ' οἱ πονοῦντες *Ald.*: καὶ ἰδοὺ πονοῦντες *A*: καὶ ὅτι οὐ πονοῦντες *Wimm., praeunte Schn.* t. 2 p. 613, qui καὶ ὅτι οὐχ οἱ πονοῦντες *ex Phot.* 529a22–3 *coni.*: καὶ διότι οὐχ οἱ πονοῦντες *Schn.* t. 5 p. lix 167 οὐδὲ συντείνοντες οὐδὲ κατέχοντες *Grang. ex Probl.* 866b9 (*cf. Phot.* 529a23–4): οὐδὲ συγγεγονότες οὐδὲ κατέχοντες *A*: οὐδὲ (οἱ) συντείνοντες οὐδὲ (οἱ) κατέχοντες *Schn.* 168 ἀνῶσιν *Grang. ex Probl.* 866b10 (*cf. Phot.* 529a24): ὥσιν *A* πονούντων *Grang. (cf. Phot.* 529a25): πάντων *A* 171 *post* μᾶλλον *add.* τῶν πόρων *Schn.* 171–4 καὶ ἡ κάθεξις—ἐμφράττοντος] *haec verba post* ἐκπίπτειν (*v.* 179) *colloc. Grang. et Schn.* 171 κάθεξις *Grang. ex Probl.* 866b11 (*cf. Phot.* 529a27): καχεξία *A* 172 διιέναι *A*: ἐξιέναι *Schn., qui t.* 4 p. 791–2 *ad Probl.* 866b11 *spectat* 173 πλήρεις οὔσας *Furl. ex Probl.* 866b12: πλήρους δύσιν *A* 174 ἀνεθῇ *O et Grang.; vid. etiam Schn.* t. 2 p. 613, qui *ad Probl.* 868b28 *spect.*: ἀναίσθητή *A*: ἐναθροισθῇ *Furl. (vel ἀθροισθῇ) Schn.* t. 2 p. 613: ἀφωθῇ *Schn. ex Probl.* 868b21 175–9 (ἔπει)τα—ἐκπίπτειν] *haec verba ad v.* 171 *ante* καὶ ἡ κάθεξις *transposuit Schn., Grang. praeunte* 175 (ἔπει)τα δὲ *Grang.*: τάδε *A* 175–7 ἡ ἀπόκρισις ἡ ὑπὸ τῆς θερμότητος γινομένη διὰ τῶν πόρων ἐκ τοῦ ὑγροῦ πνεύματος ἡ καὶ ἄγει πρὸς τὸ ἐπιπολῆς *A*: *crucis*

- 25 And men do not sweat more as they exert themselves but when they stop, neither as they make tense nor restrain the breath but when they release (it). The cause (is found) in the following (conditions). As men exert themselves the vessels which are inflated with the breath cause the pores to close up; but once they stop, (the vessels) contract, so that more moisture passes out through (pores) which are wider and, as it were, opened up. And restraining the breath fills the vessels, so that it prevents (the moisture) from going through, as (occurs in the case of) the water which (escapes) from water-catchers,²⁴ when they are full and someone closes (the opening at the top). When it is released, then (the
- 26 water) passes out, since nothing is in the way. Next, there is also the separation of breath from what is moist, occurring through the pores on account of heat † ... and brings † to the surface.²⁵ When exertions stop, the heat ceases at the same time, and from the breath as it cools there arises that moisture which we call sweat. As a result it flows out both in greater amount and more freely.

166–72 Phot. 278 529a29–31 (CB vol. 8 p. 168.23–9) (I read) that men sweat more, not as they exert themselves but when they stop, neither as they make tense nor restrain the breath but when they release (it), because as men exert themselves the vessels which are inflated with the breath cause the pores to close up, so that more moisture passes out through (pores) which are wider. And restraining the breath fills the vessels, so that it prevents (the moisture) from going through.

²⁴ The κλεψύδραι in question are not water-clocks but domestic utensils for picking up liquid.

²⁵ It is breath which is brought to the surface. Cf. *Problems* 2.20 868a22. If the text of Wimmer² is accepted, then the sentence might be translated: “Next the secretion of moist breath, occurring on account of heat, is brought to the surface through the pores.”

posui: ἡ ὑπὸ τῆς (κινήσεως) γινομένη θερμότης διὰ τῶν πόρων ἐκ τοῦ ὑγροῦ πνεύματος ἀποκρίνει καὶ ἄγει πρὸς τὸ ἐπιπολῆς *vel* ἡ ἀπόκρισις (<τοῦ αὐτομάτου> *t. 5 p. lix*) ἡ ὑπὸ τῆς θερμότητος γινομένη διὰ τῶν πόρων [ἐκ] τοῦ ὑγροῦ πνεύματος (*sine* πνεύματος *t. 5 p. lix*) ἐξάγεται πρὸς τὸ ἐπιπολῆς *Schn. t. 4 p. 791, qui spect. ad Probl. 868a20–2*: ἡ ἀπόκρισις ἡ ὑπὸ τῆς θερμότητος γινομένη [ἐκ] τοῦ ὑγροῦ πνεύματος διὰ τῶν πόρων ἐξάγεται πρὸς τὸ ἐπιπολῆς *Wimm.² et (fort. ἥκει αἰεί pro ἐξάγεται) Baltegazzone 177 δὲ παύσεται Grang. ex Probl. 868a23*: δ' ἐπαίσθηται *A ἄμα Schn. t. 2 p. 613 et t. 5 p. lix ex Probl. 868a23*: ἄπασα *A λήγει Schn. t. 1 p. 818, t. 4 p. 791 ex Probl. 868a23 et t. 5. p. lix*: διίη *A*: διίει *D* 179 ὥστε *O*: ὥστ' εἰ *A*

- 27 μετὰ δὲ τοὺς δρόμους καὶ τοὺς πόνους ἐν τῇ σκιᾷ μᾶλλον 180
 ἰδρῶσιν ἢ ἐν τῷ ἡλίῳ διὰ τὸ τὸν ἥλιον ἀναξηραίνειν καὶ
 πυκνοῦν τοὺς πόρους· ὅλως γὰρ οὔτε πολὺ τὸ θερμὸν ἄγαν οὔτε
 ὀλίγον δεῖ τὸ ἐκτὸς εἶναι· τὸ μὲν γὰρ οὐ κινεῖ τὸ δ' ἀναξηραίνει.
 28 διὸ καὶ εἴ τις ἄγαν ἐγγὺς ἴσταται τοῦ πυρὸς ἦττον ἂν ιδίσειεν, καὶ
 ἐν τοῖς ἀλειπτηρίοις ἐὰν μὲν εὐθὺς ποιήσῃ τις πολὺ πῦρ ἦττον 185
 ἰδρώσειεν, ἐὰν δ' ὕστερον ἐπεισενέγκῃ, μᾶλλον δέ· προοδο-
 ποιουμένου μὲν γὰρ καὶ παρορμῶντος τοῦ σώματος συνεργεῖ καὶ
 τὸ ἐπεισελθὼν, ἐκείνο δ' οὐ δύναται τὸ πλεῖον δι' ἀσθένειαν.
 29 ταὐτὸ δέ πως τοῖς διηρημένοις καὶ ὅτι τρέχοντες ἦττον ἰδρῶσιν
 ἢ παυσάμενοι· τὸ μὲν γὰρ ἢ τε τοῦ πνεύματος κάθεξις καὶ ἢ τοῦ 190
 ἀέρος κίνησις κωλύει· ποιεῖ μὲν γὰρ οἶον * * * μὲν αὐτὸς αὐτῷ.
 παυσάμενου δὲ καὶ στάντος ἀμφοτέρω λήγει καὶ οὐδὲν κωλύει.
 30 τὰ δ' ὑπὸ τοῦ ὕδατος κάτω φερόμενα μέρη τοῦ σώματος οὐ
 δι᾽ ἰδρῶσιν ὅτι κωλύει τὸ ὕδωρ τὴν τῆξιν· ὁ δὲ ἰδρῶς τῆξις τίς
 ἐστίν οἶον τῶν κακῶς προσωκοδομημένων ταῖς σαρκὶν ὅταν 195
 ἐκκρίνηται διὰ τὸ θερμόν.
 31 οἱ δὲ γυμναζόμενοι διαλιπόντες τὸ τρέχειν ἢ παλαίειν μᾶλλον

180–2 *Phot.* 278 529a29–31 (*CB t.* 8 p. 168.30–169.2) ὅτι μετὰ τοὺς πόνους καὶ τοὺς δρόμους οἱ ἐν σκιᾷ μᾶλλον καθεζόμενοι ἰδρῶσιν ἢ περὶ οἱ ἐν τῷ ἡλίῳ, διότι ὁ ἥλιος ἀναξηραίνει καὶ πυκνοῖ τοὺς πόρους 193–6 *Phot.* 278 529a31–5 (*CB t.* 8 p. 169.2–6) ὅτι τοὺς πόδας οἱ τῷ ὕδατι ἐμβάλλοντες οὐχ ἰδρῶσι, διότι τὸ ὕδωρ κωλύει τὴν τῆξιν· ὁ δὲ ἰδρῶς τῆξις ἐστὶ τῶν κακῶς προσωκοδομημένων ταῖς σαρκὶν, ὅταν ἐκκρίνηται διὰ τὸ θερμόν 197–200 *Phot.* 278 529a35–7 (*CB t.* 8 p. 169.7–9) ὅτι τὸ γυμνάσιον, ἐὰν γίνωτο συνεχῶς, ἀναξηραίνει καθάπερ ὁ ἥλιος· διὸ ἦττον ἰδρῶσιν

181–2 *Probl.* 2.9 867a20–1 (*BT p.* 21.28–9) 185–8 *Probl.* 2.11 867a28–b3 (*BT p.* 22.6–20), 32 869b20–3 (*BT p.* 28.17–20), 36 870a21–2 (*BT p.* 29.28–9) 189–90 *Probl.* 2.24 868b18–19 (*BT p.* 25.26–7) 193–6 *Probl.* 2.2 866b15–18 (*BT p.* 20.11–14) 197–200 *Probl.* 2.7 867a8–11 (*BT p.* 21.16–19)

180–1 (οἱ) ἐν τῇ σκιᾷ (καθεζόμενοι) μᾶλλον ἰδρῶσιν ἢ (οἱ) ἐν τῷ ἡλίῳ *Schn. ex Phot.* 529a29–30, *vid.* 1.4 p. 792 182 θερμὸν *Grang.*: θερινὸν *A* 183 δεῖ *Furl.*: διὰ *A* *post* εἶναι *suppl.* χρῆ (re vera χρῆ) *Grang.* 184 ιδίσειεν *A*: ἰδρώσειεν *R* (cf. *Schn. qui t.* 5. p. lix hanc lectionem respuit) 185 πῦρ *Furl. ex Probl.* 2.11 et 32: ὕδωρ *A* 186 μᾶλλον δὲ *A*: μᾶλλον *D* 187 σώματος *Furl.*: σήματος *A* 188 δι' ἀσθένειαν *A*: δι' ἀσυμμετρίαν *coni. Schn. t.* 2 p. 613 189 ante τοῖς *add.* καὶ *Schn.* 191–2 ποιεῖ μὲν—οὐδὲν κωλύει *A*: *om. D et cett., etiam Ald., Grang., Heins., Furl. et Schn. qui ipse verba ex A suppl. t.* 5 p. lix et 175 191 ante μὲν *lac.* 3–4 *litt.* *A*: ἐμφοραγμὸν vel ἀποφοραγμὸν vel simile verbum *coni. Schn. t.* 5 p. 175 αὐτῷ *A*: αὐτῷ *Schn. t.* 5 p. lix 192 οὐδὲν *A*: οὐθὲν *Wimm.* 193 τὰ δ' ὑπὸ τοῦ ὕδατος κάτω φερόμενα μέρη τοῦ σώματος *A*:

→

- 27 After periods of running and exertion, men sweat more in the shade than in the sun because the sun dries up (moisture) and closes the pores. For generally the external heat must be neither too much nor too little, for the latter produces no motion while the former dries up (moisture).
- 28 For this reason if someone stands too near the fire, he would sweat less; and in the sudatories if someone makes a large fire straightway, he would sweat less; but if he adds on later,²⁶ more. For when the body is prepared and inclined (to sweat), the addition too joins in working the effect; but that (initial smaller fire) is powerless for the most part on account of weakness.²⁷
- 29 The fact that men sweat less when running than having stopped is also in a way the same phenomenon as what has been distinguished.²⁸ For in the former case (i.e., when running), restraining the breath and the movement of the air prevent (sweating). For it causes as it were * * * But when he has stopped and stands still, both cease (to have an effect) and nothing prevents (sweating).
- 30 Men do not sweat on the parts of the body borne down below the water, because the water prevents liquefaction. Sweat is a certain liquefaction, as of badly made additions to the flesh, when (the additions) are secreted on account of heat.
- 31 Men taking exercise who run or wrestle intermittently sweat more

180–2 Phot. 278 529a29–31 (CB vol. 8 p. 168.30–169.2) (I read) that after periods of exertion and running, men who sit down in the shade sweat more than those in the sun, because the sun dries up (moisture) and closes the pores. 193–6 Phot. 278 529a31–5 (CB vol. 8 p. 269.2–6) (I read) that men who immerse their feet in water do not sweat, because the water prevents liquefaction. Sweat is liquefaction of badly made additions to the flesh, when (the additions) are secreted on account of heat. 197–200 Phot. 278 529a35–7 (CB vol. 8 p. 169.7–9) (I read) that taking exercise, if it is continuous, dries out (the moisture) just as the sun does. Therefore men sweat less.

²⁶ I.e., if he begins with a small fire and adds to it over a period of time.

²⁷ Or “but that larger (fire at the outset) is powerless on account of weakness.” If the emendation of Schneider is accepted, the final prepositional phrase may be translated “on account of a lack of proportion.”

²⁸ In section 25.

οἱ δὲ τὰ κάτω μέρος τοῦ σώματος τῷ ὕδατι (θερμῷ ὕδατι *t. 5 p. lix*) ἐμβαλόντες *Schn. i. 4 p. 793*, *qui ad Phot. 529a31–2 et Probl. 866b15 spect.* 193–4 οὐ δι᾽ ἰδρῶσιν *A*: οὐχ ἰδρῶσιν *Schn. ex Phot. 529a32*: οὐδ' ἰδρῶσιν *Furl. et Burn. p. 136* 195 ἐστὶν οἶον τῶν κακῶς *A*: ἐστὶ τῶν οἶον κακῶς *Schn.* 197 διαλείποντες τὸ τρέχειν *Schn.*: διαπαλαίοντες τῷ τρέχειν *A* (ἐν *ante* τῷ *alt. manu supra lin.*) *B*: διαλείποντες τῷ τρέχειν *Grang., qui ad Probl. 867a8–9 spectat, et (τὸ) Furl.*

- ἰδροῦσιν ἢ ἐὰν συνεχῶς, ὅτι συναθροίζεται διαπαυομένων ἢ
 ὑγρότης. εἶτα ταύτην ἐξάγει ὕστερον ἢ πάλιν καὶ ὁ δρόμος· ἢ δὲ
 συνεχῆς ἀναξηραίνει καθάπερ ὁ ἥλιος καὶ τὰ πνεύματα. 200
- 32 διότι μᾶλλον ἰδροῦσι τὸ ὀπισθεν τῶν ἔμπροσθεν, καί(τοι) ἢ
 θερμότης καὶ ἢ ὑγρότης πλείων ἐν τοῖς ἔμπροσθεν *** ὅτι διὰ τε
 τὴν πάλιν καὶ τὴν τρίψιν ἦττον κωλύεται καὶ ἢ διάστασις ἐκ
 τῶν ἄνω μᾶλλον· ὅπου δὲ πόνος ἐνταῦθα καὶ ἰδρῶς. ἅμα δὲ καὶ
 ἢ διάστασις τοῦ πνεύματος ἐξωθεῖ μᾶλλον, ὥσθ' ὅταν ἀνεθῇ 205
 πλείον καὶ ἀθροωτέρως ἐκείθεν.
- 33 τὸ δὲ πρόσωπον μάλιστ' ἰδρῶσιν ἀσαρκότερον ὄν καὶ ἥκιστα
 πονοῦν ὅτι καὶ ἢ κεφαλὴ ὑγρὰ καὶ μανή· ὑγρότητος δὲ καὶ μανό-
 τητος ἄλλα τε πολλὰ σημεία καὶ ὁ ἐγκέφαλος καὶ ἢ τριχῶν
 ἔκφυσις, ὁ μὲν τὸ ὑγρὸν αἰ δὲ τὸ μανὸν ἀποδηλοῦσαι, διὸ καὶ 210
 πρῶτον καὶ μάλιστ' ἰδρῶσι τὸ μέτωπον· τοῦτο γὰρ ὑπὸ τὸν
 ἐγκέφαλον. ἔτι δ' ἢ τοῦ πνεύματος κάθεξις διατείνεται πῶς εἰς
 τὴν (κε)φαλὴν.
- 34 ὅτι δὲ τὰς χεῖρας τρίβοντες μάλισθ' ἰδρῶσιν ἂν τᾶλλα
 ὁμοιοσχημονῶσιν, κατὰ συμβεβηκός πῶς τὴν αἰτίαν ληπτέον. 215
 ἰσχύουσι γὰρ μάλιστα τῷ τόπῳ· τὸ γὰρ πνεῦμα οὕτω κατέχουσι

207-13 *Phot.* 278 529a37-41 (*CB t.* 8 p. 169.9-13) ὅτι τὸ μέτωπον πρῶτον καὶ
 μάλιστα ἰδροῦσι διὰ τὸ ὑπὸ τὸν ἐγκέφαλον εἶναι ὑγρὸν ὄντα. καὶ ἢ κεφαλὴ
 δὲ μάλιστα ἰδροῖ διὰ τὸ μανόν—σημεῖον δὲ αἰ τρίχες—καὶ (*M:* *om.* καὶ *B*)
 διότι τοῦ πνεύματος ἢ κάθεξις διατείνεται πῶς εἰς τὴν κεφαλὴν

201 *Probl.* 2.14 867b12 (*BT p.* 22.30) 207-12 *Probl.* 2.17 867b34-868a4 (*BT*
p. 23.21-24.2) = 36.2 965b4-13 (*BT p.* 302.20-303.9) 207-11 *Probl.* 2.10
 867a23-7 (*BT p.* 22.1-5) 214-21 *Probl.* 2.5 866b33-867a3 (*BT p.* 21.4-11)

198 ὅτι συναθροίζεται διαπαυομένων *Schn.*, *qui t.* 4 p. 793 *ad Probl.* 867a9-
 10 *spect.*: ὅτι ναθροίζεται διαπαυόμενον *A:* ὅτι ἀθροίζεται διαπαυόμενον (*alt.*
manu mg. -ων) *B:* συναθροίζεται διαπαυόμενον *Ald.*: συναθροίζεται γὰρ καὶ
 διαπαυομένων (*re vera* συναθροίζεται) *Grang.* 199 ἢ πάλιν *B:* ἢ πάλιν *A*
 201 τὸ *A:* τὰ *Ald.* 201-2 καί(τοι) ἢ θερμότης καὶ ἢ *scripsi*: καὶ ἢ θερμότης
 καὶ ἢ *A:* (εἰ) καὶ ἢ θερμότης καὶ ἢ *Grang.*: καί(τοι) θερμότης καὶ *Furl.* 202
 ὑγρότης *Grang.*: πρὸ τῆς *A lac. statuit Schn.* 1.2 p. 614 *et t.* 5 p. lix 203
 τρίψιν *A:* θλίψιν *Furl.* ἢ διάστασις *A:* διάτασις *Furl.* 204 ἄνω μᾶλλον
Grang.: ἄνω μάλων *A* ὅπου δὲ *Lap:* ὅτι οὐδὲ *A:* ὅτι ὅπου *Grang.* 205
 διάστασις *A:* διάτασις *Furl.* 207 ἀσαρκότερον *Furl.*: ἀσαρκώτερον *A*
 208-9 καὶ μανή· ὑγρότητος δὲ καὶ μανότητος *Grang.*: κόμαι (*lac. 1 litt.*) ἢ τὰ
 δὲ τευμονότητος (*ut videtur*) *A (certe)* *D:* κόμ (*lac. 3-4 litt.*) δὲ πνευμονότητος
Ald. 210 μανὸν *D:* (2 *litt. incert.*) νὸν *A* διὸ *D:* διὰ *vel* διὸ *A* 211 →

than if (they exercise) continuously, because when they pause moisture collects. Then later the wrestling and running bring it out; but continuous (exercise) dries up (moisture) just as the sun and wind do.

- 32 Why men sweat more on the back than the front, although the heat and the moisture are greater in front * * *²⁹ because it is prevented less on account of the wrestling and the rubbing, and the expansion (of the breath) from the upper (parts) is greater; and where there is exertion, here too there is sweat.³⁰ At the same time too the expansion of the breath drives out more, so that when (the breath) is released there is a larger and more concentrated (amount of sweat) from there.
- 33 Men sweat especially on the face which has less flesh and exerts itself least, because the head is moist and rare (in texture). In addition to many other signs of moisture and rarity, there are the brain and the growth of hairs. The former reveals moisture and the latter rarity. For this reason men sweat first and especially on the brow. For this (part of the body) is below the brain. Moreover, restraining the breath extends in a way to the head.³¹
- 34 Rubbing the arms men sweat most if they maintain the same position with the other (parts of the body). One should adopt an explanation which is in a way *per accidens*. For men are most strong in the region; for they restrain the breath thus, being strong in what is nearest.³² Exert-

207–13 Phot. 278 529a37–41 (CB vol. 8 p. 169.9–13) (I read) that men sweat first and especially on the brow on account of (its) being under the brain which is moist. And the head especially sweats on account of rarity—the hairs are a sign—and because restraining the breath extends in a way to the head.

²⁹ Schneider vol. 2 p. 614 suggests that the solution to the preceding problem has fallen out along with a new problem which governs the subsequent discussion.

³⁰ The translation is based on an emendation: ὅπου, “where,” instead of the negative οὐδὲ, which is found in codex A.

³¹ Schneider vol. 2 p. 614, suggests that this sentence is a remnant of a new problem.

³² In the heart.

ἰδρῶσι A: ἰδροῦσι *alt. manu supra lin.* A τὸ μέτωπον D: τὸ μέ τὸ μέτωπον (*ui videtur*) A ante ὑπὸ *suppl.* πρῶτον Schn. *ι. 2 p. 614, ex Probl. 2.17 868a3 et 36.2 965b13* 213 κεφαλὴν R: (*lac. c. 3 litt.*) φαλὴν A 214 μάλισθ' D: μάλισθα A ἰδρῶσιν A: ἰδροῦσιν *alt. manu supra lin.* A 215 ὁμοιοσχημονῶσιν, κατὰ συμβεβηκός *πως Ald.: ὁμοιοσχημονῶσι κατὰ συμβεβηκός: (sic) πῶς A* 216 *ante τῷ τόπῳ add. τούτῳ Grang. et Forst.² ex Probl. 866b35: τῷ πόνῳ alt. manu mg. B οὕτω A: τούτῳ Grang. ex Probl. 866b35*

τὸ ἐγγυτάτω ἰσχύοντες· πονοῦντες δὲ μᾶλλον ἰδροῦσιν· οὕτω δὲ ἔχοντες τὸ πνεῦμα μάλιστα κατέχουσιν. εἶτα καὶ χειρὶ τριβομένων συμπονοῦμεν μᾶλλον (ἢ) ὅταν ἄλλο τι μέρος τριβόμεθα· τῇ γὰρ καθέξει τοῦ πνεύματος καὶ γυμναζόμεθα καὶ τρίβοντες 220 μᾶλλον ἰδροῦμεν.

35 καὶ ὅταν τοὺς πόδας καὶ τὰς κνήμας [ἴν'] ἐν τῷ ὕδατι ἔχωσιν † ἢ ὅταν τὸ ἄλλο σχῆμα † διὰ τε τὰ προειρημένα· κωλύει γὰρ τὸ ὕδωρ τὸν ἰδρώτα· καὶ ὅτι διαθερμαινομένων τούτων καὶ τὸ ἄνω συνθερμαίνεται· οἱ δ' ἰδρώτες ὅπου θερμὸν καὶ ὑγρόν. 225

36 ἄτοπον δ' ὅτι οἱ ἀγωνιῶντες τοὺς πόδας ἰδρῶσι, τὸ δὲ πρόσωπον οὐ· καίτοι μᾶλλον εὐλογον τὸ μάλισθ' ἰδρωτικὸν καὶ μὴ τὸ ἥκιστα. τὸ δ' αἴτιον ὅτι ἡ ἀγωνία ἐστὶν οὐ μετὰστασις θερμότητος ὥσπερ ἐν τοῖς φόβοις, ἀλλὰ μᾶλλον αὐξήσις καθάπερ ἐν τῷ θυμῷ· καὶ γὰρ ὁ θυμὸς ζέσις τοῦ περὶ καρδίαν 230 θερμοῦ· καὶ ἀγωνιῶντες δ' οὐ διὰ φόβον τοῦτο πάσχουσιν ἀλλὰ † τὸ μὲν οὐ διὰ τὸ, τὸ μὲν πρὸς ὃ ατο † μᾶλλον θερμαίνεσθαι, 37 ξηραίνει γὰρ ἡ θερμότης ἐπιπολάζουσα, τὸ δ' ἐν τοῖς ποσὶ

226–30, 232–5 *Phot.* 278 529a41–b7 (*CB* i. 8 p. 169.14–21): ὅτι οἱ ἀγωνιῶντες τοὺς πόδας ἰδροῦσι, τὸ δὲ πρόσωπον οὐ, διότι ἡ ἀγωνία οὐ μετὰστασις θερμότητος ἀλλ' αὐξήσις, καθάπερ ὁ θυμὸς· διὸ τὸ μὲν πρόσωπον ἐξέρυθροι γίνονται καὶ οὐχ ἰδροῦσι διὰ τὸ μᾶλλον ἐκθερμαίνεσθαι, ξηραίνει γὰρ ἡ θερμότης ἐπιπολάζουσα, τὸ δ' ἐν τοῖς ποσὶ συντήκει διὰ τὸ ἔλαττον εἶναι ὥστε ξηρᾶναι, πλείω δὲ τῆς ἐμφύτου καὶ προὑπαρχούσης.

226–32 *Probl.* 2.26 868b34–7, 869a2–7 (*BT* p. 26.13–16, 19–24) 226–8 *Probl.* 2.31 869b4–6 (*BT* p. 28.1–3) 230–1 *Arist., De an.* 1.1 403a31–b1 (*CB* p.4.19–20) 232–5 *Probl.* 2.27 869a8–12 (*BT* p. 26.25–9)

227 τὸ ἐγγυτάτω *A*: τῷ ἐγγυτάτῳ *B et Grang.* ἰσχύοντες *A*: (τοῦ) ἰσχύοντος *Schn. ex Probl.* 866b36 μᾶλλον (*ut videtur*) *D* (*certe*) *R*: μᾶλ *A* 217–18 ἰδροῦσιν· οὕτω δὲ ἔχοντες τὸ πνεῦμα μάλιστα κατέχουσιν *Grang.*: ἰδροῦσι τοῦ ἔχοντες μάλιστα τὸ πνεῦμα· μάλιστα κατέχουσιν *A* (ἰδροῦσι τοῦ ἔχοντος) *R* (ἰδροῦσιν τοῦ ἔχοντος) *Ald.*: ἰδροῦσιν. τούτῳ γὰρ μάλιστα τὸ πνεῦμα κατέχουσιν *Furl.*: ἰσχύουσιν· οὕτω δ' ἔχοντες τὸ πνεῦμα μᾶλλον κατέχουσιν *Schn. ex Probl.* 866b37 218–19 χειρὶ τριβομένων συμπονοῦμεν μᾶλλον (ἢ) *Grang. ex Probl.* 867a1: χειρὶ τριβομένων συμπονούμενοι ἄλλων *A*: χειρὶ τριβομένη συμπονοῦμεν μᾶλλον (ἢ) *Furl.* ((τῇ) χειρὶ) *Schn.* 220 *ante* γυμναζόμεθα *add.* τριβόμενοι (*re vera* τριβόμενοι) *Grang. ex Probl.* 867a3 *posi* τρίβοντες *add.* διὸ καὶ *Grang.* 220–2 τρίβοντες μᾶλλον ἰδροῦμεν. καὶ ὅταν *A*: τρίβοντες. μᾶλλον (δὲ) ἰδροῦμεν καὶ ὅταν *Forst.*² 222 *en Grang.*: ἴν' ἐν *A* ἔχωσιν *A*: ἔχωμεν *Forst.*² 222–3 *post* ἔχωσιν *crucem et alteram ante* διὰ *posui, sed fines corruptionis incertae* 223 *ante* ἢ *suppl.* ἦττον ἰδροῦσι *Grang.* (—οὔσιν) *Furl.* σχῆμα διὰ τε τὰ προειρημένα *A*: σῶμα διὰ τε τὰ προειρημένα *Furl.* (*sine* τε) *Heins.* 224 *post* ἰδρώτα *lac. indic.* →

ing themselves they sweat more, and being in this condition they restrain the breath most. Then too while being rubbed on the arm, we share the exertion more than when we are rubbed on some other part. For by restraining the breath, we both get exercise and, rubbing, sweat more.

- 35 And when men have their feet and shins in the water † or when the other position, †³³ on account of what has been said previously³⁴ — for the water prevents sweat — and because, as these (parts) are heated through, the upper (body) too is heated as well. And sweat occurs where it is hot and moist.
- 36 It is odd that men who are anxious sweat on their feet and not on the face. And yet it seems more reasonable that (they sweat on the part) which is most capable of sweating and not that which is least. The explanation is that anxiety is not a removal of heat as in fright, but rather an increase like in anger. For anger is a boiling of the hot (matter) around the heart; and men who are anxious suffer this³⁵ not on account
- 37 of fright but † ... † being heated to greater degree.³⁶ For the heat coming

226–30, 232–5 Phot. 278 529a41–b7 (CB vol. 8 p. 169.14–21) (I read) that men who are anxious sweat on their feet and not on the face, because anxiety is not a removal of heat but an increase as is anger. Therefore they become red in the face and do not sweat on account of being heated up to a greater degree. For the heat coming to the surface dries, but it effects colliquescence in the feet because it is less than that needed for drying and more than that which is natural and already present.

³³ If we supply ἥττον ἰδρῶσιν before ἥ and change σχῆμα to σῶμα, then we may translate “they sweat less than when (they have) the rest of their body (in the water).”

³⁴ The reference is to 30.193–4.

³⁵ The pronoun τοῦτο, “this,” seems to refer to sweating.

³⁶ If we accept the conjecture of Forster, we may translate: “but on account of being heated to a greater degree. And they become red in the face and do not sweat on account of being heated to a greater degree.”

Schn.: add. ἐν τοῖς κάτω *Forst.*² post καὶ (pr.) suppl. ποδῶν θερμαινομένων μάλισθ' ἰδρῶτες γίνονται *Grang.*, qui ad *Probl.* 2.19 868a10–14 spect. τὸ ἄνω A: τὰ ἄνω *Grang.* 227 μάλισθ' D: μάλλιστα A 227–8 καὶ μὴ τὸ *Schn.*: καὶ τὸ μὴ A: ἥ τὸ *Furl.* 230 ante καρδίαν add. τὴν *Schn.* ex *Probl.* 2.26 869a6, sed in definitione irae, quae in *Arist. De an.* 1.1 invenitur, τὴν deest 231–2 ἀλλὰ τὸ μὲν οὐ διὰ τὸ, τὸ μὲν πρὸς ὃ αὐτὸ μᾶλλον θερμαίνεσθαι (ut videtur) A (certe) D: cruces posui: ἀλλὰ [τὸ μὲν οὐ διὰ τὸ, τὸ μὲν πρὸς] διὰ τὸ μᾶλλον θερμαίνεσθαι *Grang.* (ἐκθερμαίνεσθαι) *Furl.*: ἀλλὰ διὰ τὸ μᾶλλον ἐκθερμαίνεσθαι. (διὸ τὸ μὲν πρόσωπον ἐξέρυθροι γίνονται καὶ οὐχ ἰδρῶσι διὰ τὸ μᾶλλον ἐκθερμαίνεσθαι) corr. et suppl. *Schn.* ex *Phot.* 529b3–4; et sine postremis verbis καὶ οὐχ—ἐκθερμαίνεσθαι *Schn.* i. 2 p. 615 et i. 5 p. lix: ἀλλὰ διὰ τὸ μᾶλλον θερμαίνεσθαι. (καὶ τὸ πρόσωπον ἐξέρυθροι γίνονται, οὐχ ἰδρῶσι δὲ, διὰ τὸ μᾶλλον θερμαίνεσθαι) *Forst.*² ex *Probl.* 869a8–9 233 post ἐπιπολάζουσα suppl. τὸ ἐν τῷ προσώπῳ ὑγρὸν *Grang.* ex *Probl.* 869a9–10

συντήκει διὰ τὸ ἐλάττω μὲν εἶναι ὥστε ξηρᾶναι πλείω δὲ τῆς
 συμφύτου καὶ προϋπαρχούσης.

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38 ἔνιοι δ' ἰδροῦντες (ναυτιῶσιν) ἂν ψυχθῶσιν ἢ πνεύματι ἢ
 ὕδατι· συμβαίνει γὰρ ναυτιᾶν οὐκ ἀλόγως· καὶ ὅτι τὸ ὑγρὸν
 ψυχθὲν ἀθρόον ἔσται, πρότερον οὐχὶ ῥίγουν· καὶ ὅτι τὸ πνεῦμα,
 τὸ ἴδιον καὶ ἔξω γινόμενον ἰδρώς, τοῦτο ψυχθὲν καὶ ὑγρὸν γενό-
 μενον προσπεσὸν τῷ ἀναπνευστικῷ τόπῳ ποιεῖ τὴν ναυτίαν.

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39 οἱ δ' ἐν ἱματίῳ δρόμοι καὶ ἰδρώτες καὶ (ἐλαίου ἀλεί)ψεις εἰς
 ἱμάτιον ἀχρόους ποιοῦσι διότι ἡ εὐχροια γίνεται δι' εὐπνοίαν, ἢ
 δ' ἄχροια διὰ τὴν κατάπνιξιν· συνθερμαινόμενον γὰρ καὶ μὴ
 διαψυχόμενον τὸ ἐπιπολῆς ὑγρὸν ἄχροιαν ποιεῖ. τοῦτο δὲ συμ-
 βαίνει καὶ ἐκ τῶν δρόμων καὶ ἐκ τῆς ὑπαλείψεως· οἱ δὲ γυμνοὶ
 δρόμοι διὰ τοῦναντίον· εὐχροοὶ γὰρ· καὶ καταψύχει ὁ ἀήρ τὰς
 συνισταμένας ἐκκρίσεις καὶ διαπνεῖ (τὸ σῶμα).

245

40 ἐν δὲ τοῖς ὕπνοις οἱ ἰδρώτες μᾶλλον ἢ ἐγρηγορόσιν ὅτι καὶ
 ὑγρότατα καὶ θερμότατα πάντα διὰ τὴν ἀντιπερίστασιν· ἐξ
 ἀμφοῖν δὲ τούτων ὁ ἰδρώς ὥσπερ εἴρηται πολλάκις.

250

248–50 *Phot.* 278 529b7–10 (*CB* 1.8 p. 169.21–4) ὅτι ἐν τοῖς ὕπνοις μᾶλλον οἱ
 ἰδρώτες ἢ κατὰ τὴν ἐγρήγορσιν, διότι καὶ τὰ ὑγρά καὶ τὰ θερμὰ μᾶλλον διὰ
 τὴν ἀντιπερίστασιν· ἐξ ἀμφοῖν δὲ τούτων οἱ ἰδρώτες.

236–40 *Probl.* 2.18 868a5–9 (*BT* p. 24.3–7) 241–7 *Probl.* 2.30 869a24–5,
 33–b1 (*BT* p.27.12–13, 21–7) , 38.3 966b34–967a3 (*BT* p. 306.22–307.5)
 248–50 *Probl.* 2.16 867b31–3 (*BT* p. 23.18–20) 248 *Probl.* 2.28 869a13
 (*BT* p. 27.1)

234 ἐλάττω *Ald.*: ἐνάττω *A*: ἐλάττων *Forst.*¹ *ex Probl.* 869a11 ante ὥστε
add. ἢ *Forst.*¹ πλείω *A*: πλείων *Forst.*¹ *ex Probl.* 869a11 235 συμφύτου
A: ἐμφύτου *Grang.*, cf. *Probl.* 869a11 προϋπαρχούσης *B*: προϋπάρχουσιν *A*
 236–7 ἔνιοι δ' ἰδροῦντες (ναυτιῶσιν) ἂν ψυχθῶσιν ἢ πνεύματι ἢ ὕδατι·
 συμβαίνει γὰρ ναυτιᾶν οὐκ ἀλόγως *scripsi, praeunte Grang.* (ἐὰν *pro* ἂν) *ex*
Probl. 868a5–6: ἔνιοι δ' ἰδροῦσιν ἂν ψυχθῶσιν ἢ πνεύματι ἢ ὕδατι· συμβαίνει
 γὰρ ναυτιᾶν οὐκ ἀλόγως *A*: ἐνίοις δ' ἰδροῦσιν ἂν ψυχθῶσιν ἢ πνεύματι, ἢ
 ὕδατι, συμβαίνει ναυτιᾶν· οὐκ ἀλόγως *Furl.* 238 ἔσται *Grang.*: ἐστὶ *A*
 πρότερον *Furl.*: πότερον *A*: ἔμπροσθεν *Grang.* *ex Probl.* 868a6 οὐχὶ ῥίγουν
A: οὐκ ἡρεμῶν (*sic*) διὰ τὸ ῥεῖν *Grang.* *ex Probl.* 868a7: οὐκ ἡρεμοῦν *Furl.*
 239 τὸ ἴδιον καὶ ἔξω γινόμενον *A*: τὸ διὸν ἔξω καὶ γινόμενον *Schn.*, *ex Probl.*
 868a7–8: τὸ διὸν καὶ ἔσω γινόμενον *Furl.* ἰδρώς *scripsi*: ἰδρώτων *A*: ἰδρῶς
 (διὰ τὴν ψύξιν) *Schn.* *ex Probl.* 868a8: ὕδωρ *Grang.*: *om.* *z* 239–40 τοῦτο
 ψυχθὲν καὶ ὑγρὸν γενόμενον *scripsi*: τὸ ψυχθὲν καὶ ὑγρὸν γενόμενον *A*: τοῦτο
 (ἔσω) ψυχθὲν, (πρὶν ἐξελεθῆν), [καὶ] ὑγρὸν ἐγένετο, (καὶ) *Schn.* *ex Probl.* 868a8–
 9, *ei* τὸ (δ' ἔσω) ψυχθὲν καὶ ὑγρὸν γενόμενον, (καὶ) *i.* 5 p. 175: *om.* *z* 241
 ἐν ἱματίῳ δρόμοι *Furl.* *ex Probl.* 966b34: ἡματιοδρόμοι *A*: ἱματιοδρόμοι *B* →

to the surface dries (the moisture on the face), but it causes colliquescence in the feet because it is less than that needed for drying and more than that which is natural and already present.

- 38 Some men who sweat experience nausea if they are cooled either by wind or by water. For it happens that they experience nausea not unreasonably: both because the moisture (within), being cooled, collects and stands still, whereas previously it was not cold; and because the breath (within), which is proper (to men) and outside (on the surface of the body) becomes sweat—this (breath) being cooled (within) and having become moist, attacks the region where breathing occurs and produces nausea.
- 39 Running in a cloak and sweating and anointing with oil inside a cloak make men lack color, because good color occurs on account of good ventilation and lack of color on account of smothering. For when the surface moisture is heated thoroughly and does not cool off, it produces lack of color. This happens both as a result of running and as a result of anointing (with oil). Running naked (produces its effect) on account of the opposite (condition). For men (acquire) good color; and the air cools the secretions which collect, and ventilates the body.³⁷
- 40 More sweat (occurs) when men are asleep than awake, because everything is both very moist and very hot on account of the concentration. As a result of both of these (i.e., moisture and heat) sweat (occurs), as has been said often.³⁸

248–50 Phot. 278 529b7–10 (CB vol. 8 p. 169.21–4) (I read) that more sweat (occurs) when men are asleep than during waking periods, because both what is moist and what is hot (occur) in greater degree on account of the concentration. As a result of both of these sweat (occurs).

³⁷ Or adopting Schneider's text, "Running naked produces good color on account of the opposite (condition). For the air cools the secretions which collect, and ventilates the body."

³⁸ See 18.131–2, 23.175–6, 24.179–80 and 35.244–5.

8a7–8: τὸ διὸν καὶ ἔσω γινόμενον *Furl.* ἰδρώς *scripsi*: ἰδρώτων A: ἰδρώς (διὰ τὴν ψύξιν) *Schn. ex Probl.* 868a8: ὕδωρ *Grang.* : *om.* z 239–40 τοῦτο ψυχθὲν καὶ ὑγρὸν γενόμενον *scripsi*: τὸ ψυχθὲν καὶ ὑγρὸν γενόμενον A: τοῦτο (ἔσω) ψυχθὲν, (πρὶν ἐξελεῖν), [καὶ] ὑγρὸν ἐγένετο, (καὶ) *Schn. ex Probl.* 868a8–9, *et* τὸ (δ' ἔσω) ψυχθὲν καὶ ὑγρὸν γενόμενον, (καὶ) *l.* 5 p. 175 : *om.* z 241 ἐν ἱματίῳ δρόμοι *Furl. ex Probl.* 966b34: ἱματιοδρόμοι A: ἱματιοδρόμοι B καὶ (ἐλαίου ἀλεί)ψεις *Furl. ex Probl.* 966b34, 39 *et* (sine ἐλαίου) *Grang.* : καὶ *lac.* 5–6 *litt.* ψεις A 242 ἀχρόους *Grang.*: ἀθρόους A: ἄχρους *Schn.*: εὐχρους *Furl.* 245 ὑπαλείψεως *Grang.*: ὑπολήψεως A 246 εὐχροοὶ γάρ· καὶ καταψύχει ὁ ἄηρ *scripsi*: εὐχροιοὶ γάρ· καὶ καταψύχει ὁ ἄηρ A: εὐχροοὶ. καὶ γὰρ καταψύχει ὁ ἄηρ *Grang.*: εὐχροϊαν· καταψύχει γὰρ ὁ ἄηρ *Wimmer, praeunte Schn., qui* ποιουσί *post* εὐχροϊαν *suppl.* 247 συνισταμένας *Ald.*: συνεσταλμένας A: συνεσταμένας B διαπνέει (το σῶμα) *Grang. ex Probl.* 967a3: διαπνέονται A: διαπνέοντας B 248 ἐρηγορόσιν *Schn.*: ἐρηγορώσιν A ὅτι καὶ *scripsi, Furl. praeunte*: ἔτι καὶ A: ἔτι B: ὅτι *alt. manu*

ADDITIONAL NOTES

A Preliminary Note on Modern Accounts of Sweat

Modern physiologists often use the terms “sweat,” “sweating,” etc. and “perspiration,” “perspiring,” etc.¹ with reference to three different kinds of loss of fluid through intact skin: 1) the sensible or visible loss of fluid secreted by eccrine glands and 2) by apocrine glands, and 3) the insensible or invisible loss of vaporized fluid which in part at least involves no particular gland. In some contexts, this inclusive usage is not confusing, and in dealing with Theophrastus’ treatise *On Sweat*, it may be positively advantageous, for Theophrastus uses one word, ἰδρώς, and its cognate forms for all three phenomena. Nevertheless, in presenting modern theory, it seems desirable to restrict “sweat” to the sensible loss of fluid secreted by eccrine glands. For not only is the restriction largely in line with ordinary usage, but also it serves to underline the fact that the secretion of the eccrine gland is different from—and ought not to be confused with—that of the apocrine gland.²

The eccrine glands number some three million and are found all over the body. They are composed of a coil situated deep in the dermis and a duct leading outward through the dermis and epidermis. When the temperature of the body rises, the glands are stimulated by autonomic nerves which are controlled by the brain. This stimulation results in the secretion of an odorless fluid, which is largely, but not entirely, water. The water evaporates from the surface of the skin and in doing so it cools the body.³ The glands located in the palms, soles, armpits and forehead also respond to emotional stress. The secreted fluid, sweat, contains various solutes in varying amounts, but research does not support the idea that eccrine glands have an excretory function. The presence of sodium chloride is what gives sweat its salty taste. Pigment is not part of the mix. When the secreted fluid

¹ In modern physiology, sweat is often discussed under the label “perspiration.” See, e.g., the *Encyclopaedia Britannica* (1972) vol. 17 p. 705 and the *Britannica Micropaedia* (1998) vol. 11 p. 435 s.v. “perspiration.” In *Taber’s Cyclopedic Medical Dictionary* (1985) p. 1371 and 1793–4, overlapping articles occur under both “perspiration” and “sweat.” The verbs “to perspire” and “to sweat” are listed as synonyms.

² It may also be desirable to restrict the term “perspiration” to the loss of vaporized fluid; see below.

³ In very hot conditions, the loss of water may reach ten to fifteen liters in a single day.

appears colored, the cause is external contamination. The phenomenon is called exogenous or pseudo-chromidrosis.⁴

There are also apocrine glands. They are nonfunctional prior to puberty, after which they increase in size and begin to secrete a fluid. Like eccrine glands, apocrine glands are composed of a coil and duct, but they are larger, and normally the duct does not reach the surface of the skin. Instead, it opens into a hair follicle. As a result of evolution, the apocrine glands have lost their role as scent glands useful for attracting partners with a view to reproduction.⁵ The glands are, however, closely associated with offensive body odor. During periods of emotional stress, muscular tissues surrounding the glands force out a whitish fluid which combines water with lipid material. Initially the secretion is odorless, but on the surface of the skin, the fatty content is broken down by bacteria, and a malodorous acid is produced. When the secretion appears colored—the most common color is yellow; green, blue or blue-black have also been observed—the cause may be an exogenous dye; and as with eccrine sweat, that is called pseudo-chromidrosis. Alternatively, the cause may be a pigment found in granular form within the apocrine gland itself; in such cases, one speaks of true chromidrosis. Hemathidrosis, the condition in which secreted fluid contains blood, is a different phenomenon which results from a bleeding disorder.⁶

The insensible loss of fluid is essentially evaporation. Unlike secretion by the eccrine and apocrine glands, the process occurs continuously.⁷ The mechanism is less well understood, but recent studies suggest that the loss occurs in two ways: water vapor is both diffused through the epidermis apart from any gland—here the term “perspiration” (breathing through) seems apt—and also released from eccrine ducts.⁸ In either case, what is lost is entirely vaporized water.

⁴H. Jakubovic and A. B. Ackerman, “Development, Morphology, and Physiology,” in *Dermatology*, ed. S. Moschella and H. Hurley, 2nd ed. (Philadelphia: Saunders 1985) vol. 1 p. 62–7; H. Hurley, “Diseases of the Apocrine and Eccrine Sweat Glands,” *ibid.*, vol. 2 p. 1341–68.

⁵Whereas in human beings the apocrine glands have become physiologically insignificant, in other mammals they are thought to be important to mating. For the secretion, when modified by cutaneous bacteria, gives off an identifying sexual scent.

⁶Jakubovic and Ackerman (above, note 4) p. 59–62; Hurley (above, note 4) p. 1323–32; R. Champion, “Disorders of Sweat Glands,” in *Textbook of Dermatology*, ed. A. Rook et al., 4th ed. (Blackwell: Oxford 1986) vol. 3 p. 1893–5.

⁷Through this process, an adult can lose as much as 500 to 700 grams of water in a single day.

⁸A. Jeje and D. Koon, “An Analysis of the Rates and Regulations of Insensible Water Loss through the Eccrine Sweat Glands,” *Journal of Theoretical Biology* 141 (1989) p. 303–24.

Turning now to Theophrastus, we can say that modern accounts differ significantly from what we find in *On Sweat*. In particular, Theophrastus has no knowledge of the eccrine and apocrine glands and therefore cannot offer a classification in which these glands mark differences in kind. In addition, Theophrastus does not understand that sweating has a cooling function. Aristotle had assigned that function to breathing, and Theophrastus appears to have done the same.⁹ To the extent that *On Sweat* offers a functional explanation, it is clearly excretory. Successful sweating is sweating which removes unwanted material (13.85–6; cf. 2.7–10, 20.135–40, 30.194–6).

Despite these fundamental differences, there are points of contact between modern accounts and what Theophrastus says in *On Sweat*. Here are six. First, Theophrastus thinks of sweating as loss of fluid through intact skin. He does, of course, discuss ulcers and other eruptions of the skin (13.83–17.119), but he does not confuse these abnormalities with sweating. Second, Theophrastus tells us that sweating is not always occurring. It is said to be less continuous than the secretion of breath, which is invisible to perception, for the body is always, as it were, steaming (2.14–15, cf. 19.129–31). That suggests the modern distinction between insensible perspiration which is constantly occurring and visible sweat which is occasional.¹⁰ Third, Theophrastus finds it odd that men who are anxious sweat on their feet and not on their face (36.226–7). That relates to the modern observation that the eccrine glands of the palms, soles, armpits and forehead are especially responsive to emotional stimuli; but Theophrastus does not specify the soles of the feet, and his explanation in terms of colliquescence is peculiarly Theophrastean. Fourth, Theophrastus speaks of sweat as salty (2.7). He recognizes that the degree of saltiness may vary (4.24, 27–8); but unlike modern physiologists, he makes it a fundamental characteristic of all sweat (4.23) and not a minor solute which does not contribute to the cooling process. Fifth, Theophrastus says that there is malodorous as well as odorless sweat (5.30), and he tells us that the odor is especially bad in adolescents (7.42–3). That relates to the difference between apocrine and eccrine secretion and to the fact that the apocrine gland

⁹ See the note on 13.83–6.

¹⁰ According to Theophrastus, breath is not only continually secreted (2.14–15, 19.130) but also occasionally cooled and condensed, thereby becoming visible sweat on the surface of the skin (1.3–4, 38.238–9). Assuming no ambiguity in Theophrastus' use of "breath," cooling and condensing introduce an idea which is not found in the modern theory of insensible perspiration.

becomes active during puberty. Theophrastus' explanation in terms of rot (9.56–7) is not far from the modern explanation in terms of bacteria. Sixth, when Theophrastus discusses varieties of sweat arising through the intensification of exercise, he distinguishes between a first superficial variety which is watery and thin and a variety which comes from deeper within, is heavier and has the appearance of blood (11.74–12.77). Here Theophrastus seems to be describing eccrine sweat or a combination of eccrine and apocrine sweat, in which the solute content is unusually large. The reddish color suggests hemathidrosis, but true or pseudo-chromidrosis may be what is being reported.

Notes on Individual Lines

1 Περὶ ἰδρώτων] The plural in the title Περὶ ἰδρώτων (328 no. 12 FHS&G) is in line with earlier editions. It occurs not only in codex A and most other codices, but also in Photius' *Library* 528b28 and in the list of Theophrastean works preserved by Diogenes Laertius 5.44 = 1.121 FHS&G, though only in one of the three major codices.

English speakers most often speak of sweat in the singular; they use "sweat" as a mass-word. In contrast, the plural is not uncommon in ancient Greek. We find it, for example, in the Hippocratic treatises,¹¹ in Plato¹² and in the pseudo-Aristotelian *Problems*.¹³ Theophrastus uses the plural in his treatise Περὶ ὀσμῶν (*On Odors*),¹⁴ and repeatedly in Περὶ ἰδρώτων. Of the thirty occurrences of ἰδρῶς in Περὶ ἰδρώτων, a full one-third are in the plural.¹⁵ Sometimes Theophrastus may use the plural, because he is think-

¹¹ A search of TLG under Hippocrates medicus et corpus Hippocraticum produced the following results: ἰδρῶτες 50 occurrences, ἰδρώτων 6, ἰδρῶσι(ν) 4, ἰδρῶτας 11.

¹² *Phaedrus* 239C8, cited in LSJ.

¹³ A search of TLG revealed thirty-one occurrences of the plural in the *Problems*: ἰδρῶτες 10, ἰδρώτων 7, ἰδρῶσι(ν) 2, ἰδρῶτας 12. Although the discussion of sweat is in part dependent upon Theophrastus, there are individual passages which exhibit the plural and have no parallel in *On Sweat*. See, for example, the duplicates 2.22 868b6 and 37.2 965b30. Lack of connection with *On Sweat* is noted by Flashar p. 430.

¹⁴ At *On Odors* 56, Theophrastus comments on the effect which baths have on perfumes. Some are said to maintain their scent, while others are corrupted and produce an odor which is more unpleasant than the sweat itself: αὐτῶν τῶν ἰδρώτων.

¹⁵ The excerpts of Photius exhibit the singular in five places (528b29, 33, 35, 529a4, 33) and the plural in four (528b39, 529a18, b8, 10). Two of the four plurals are departures from the manuscript tradition of *On Sweat*: τῶν ἰδρώτων (528b39) instead of τοῦ ἰδρῶτος (18.122) and οἱ ἰδρῶτες (529b10) instead of ὁ ἰδρῶς (40.250). Since Photius appears to have drawn on a manuscript independent of A, it is possible that he preserves the correct reading; and that would raise the number of occurrences of the plural in *On Sweat* from

ing of types or varieties of sweat. For example at 11.70, Theophrastus reports what the trainer Diotimus said: namely, that there are three varieties of sweat, ἰδρώτων; and four lines later at 11.74, he speaks of thinness and thickness in different varieties of sweat, ἐν τοῖς ἰδρώσιν. On other occasions, Theophrastus may use the plural, because he is thinking of cases or episodes of sweating. For example at 4.27, he introduces the plural, when drawing a distinction between more and less salty occurrences of sweat, ἰδρώτων. Similarly at 39.241 and 40.248, it may be that the plural is used to suggest multiple cases or episodes. There are, however, passages in which the plural seems to serve no special purpose and to be interchangeable with the singular. We may compare 19.132–3 with 35.223–4. Both passages are concerned with the prevention of sweat and both express prevention by using the verb κωλύειν; but in the former passage the verb is followed by the plural, τοὺς ἰδρώτας, and in the latter by the singular, τὸν ἰδρώτα. Similarly, in both 35.225 and 32.204, Theophrastus tells us where sweat occurs, and in both passages (one as emended¹⁶) he uses the conjunction ὅπου. In the former we find the plural, ἰδρώτες, and in the latter the singular, ἰδρώς. At 6.38 and 7.43, where Theophrastus is discussing the bad odor which occurs when people sweat, he uses the instrumental dative in the plural, ἰδρώσι. Perhaps the plural is meant to call attention to multiple cases, but such an explanation seems forced; the singular would do just as well. The same can be said of 21.146, where we are told that people who take exercise are habituated with regard to sweat, ⟨πρὸς⟩ τοὺς ἰδρώτας. My guess is that in these passages, 6.38, 7.43 and 21.146, Theophrastus uses the plural for no other reason than that he has been expressing himself in the plural and accordingly does so in regard to sweat.

How should we understand the plural as it occurs in the title? It is tempting to cite 11.70 and 74, and to say that the title announces a discussion of different types or varieties of sweat. We might translate “*On (Types of) Sweat*,” but if we do that, the opening remarks in section 1 are odd. For here Theophrastus declines to discuss what is a major issue in determining

ten to twelve. Nevertheless, it is most likely that the plurals should be attributed to Photius. In the first case, he introduces variation, replacing a genitive absolute with a relative clause and changing the singular to plural. In the second, he may be influenced by the plural which occurs two lines earlier in the same section of *On Sweat* (40.248). Repeating the plural (529b8 and 10) creates an appearance of consistency, but using the singular and the plural within one section can be found elsewhere in *On Sweat* (4.23 and 27, 19.128 and 133, 35.224 and 225).

¹⁶See the second note on 32.204.

how many kinds of sweat there are: namely, whether sweat occurs when moisture is secreted or when breath passes through the skin and condenses on the outside (1.2–4). Perhaps, then, the plural points to a discussion in which multiple cases or episodes of sweating will be discussed. We might translate “*On (Cases of) Sweat*” and support the translation by reference to 4.27, 39.241 and 40.248. We should, however, keep in mind that there are other passages like 19.132–3 and 35.225, in which the plural seems to be interchangeable with the singular. That suggests the simple translation “*On Sweat*.” I have adopted it not only because it suits English usage, but also because it leaves the door open to discussion of both types and cases of sweat.

In concluding this comment on the title, I want to call attention to a thesis recently advanced by Steven White. Put succinctly, his thesis is that Theophrastus probably did not assign the titles which have come down to us.¹⁷ They may, however, have originated in the Lyceum, where efficiency in teaching required that treatises have standard titles.¹⁸ These titles are regularly based on the opening line or lines of a treatise, the incipit, and often feature περί with a noun in the genitive case. Typically this noun picks up a key word in the incipit, and it is singular or plural depending on which of the two occurs there. A paradigm case is Περί ἰλίγγων (328 no. 1 FHS&G). The first two words of the incipit are οἱ ἰλίγγοι; in the title, the noun retains the plural. There are, however, titles which are exceptional, and in the judgment of White, these titles are likely not to be original. A case in point is *On Sweat*. Here codex A and most other codices offer Περί ἰδρώτων. However, a few codices offer Περί ἰδρώτος, and the opening lines of the text speak of sweat in the singular. Probably, then, the original title referred to sweat in the singular.¹⁹ That may be correct, but there are grounds for hesitation. Here are five. First, the codices which exhibit the singular carry little weight. There are four, all of which belong to a single branch labeled γ by Burnikel.²⁰ In the earliest of the four, codex R, there is no Greek title; instead a Latin title, *De sudore*, occurs in the margin. The three codices descending from R, beginning with codex M, all exhibit περί ἰδρώτος. The occurrence of the singular, *sudore* (ἰδρώτος), is evidence of

¹⁷ The idea finds support in the use of vague cross-references: e.g., ἕτερος ἔστω ἐν ἄλλοις λόγος at 1.4. See the note *ad loc.* and White p. 10 with n. 6.

¹⁸ White p. 20 n. 37.

¹⁹ White p. 26–7.

²⁰ Burnikel p. 42–8. See also Burnikel’s preliminary study, “Ein Zweig in der Überlieferung der neun ‘Fragmente’ Theophrasts,” *Rheinisches Museum* 115 (1972) p. 78–84.

affiliation between the four codices, but it is not grounds for rejecting the title as found in A and other codices. Second, Photius, who is drawing on a codex older than any of the surviving codices reports the title in the plural. Third, the opening lines (2–4) of *On Sweat* do not state what will be discussed in the treatise. On contrary, they tell us what will not be discussed, so that whoever first assigned the title may not have been influenced by these lines. If he was influenced by the immediately following lines (5–6), then the reference to multiple differences may have encouraged the plural. Fourth, there a good number of plurals within the treatise, and these may have determined the choice of title. Fifth, if the original title were in the singular, what prompted the change to the plural? Perhaps some Peripatetic or a later scribe was influenced by the plural in, say, *Περὶ ἰλίγγων* and changed other titles to conform. But that is pushing speculation. In any case, deciding between singular and plural seems of little importance if the titles are not Theophrastean in origin. I recommend careful study of White's article, but prefer to be conservative and to print the reading of codex A.

1.2 ὁ ἰδρῶς] Codex A has the definite article. It is written in the left hand margin and is large: over two lines in height. After the definite article comes a lacuna. That is remarkable, for given the preceding definite article and the text which follows, supplying ἰδρῶς seems irresistible. If there is a reason for hesitation, it is the length of the lacuna, c. nine letters, which is markedly longer than the five letters of ἰδρῶς. One wonders whether a particle has been lost along with preceding material to which the particle originally joined the first sentence of codex A. Or is the length of the lacuna no reliable indication of what has been lost? Whatever the correct answer, the lacuna recurs in other codices. The earliest codex in which ἰδρῶς appears is R (c. 1450 A.D.), and there it has been added in the margin by a second hand. In codex M, which was copied from R by the scribe who made R, ἰδρῶς has been supplied in the lacuna itself, where it is preceded by the particle δὲ. Here, too, the supplement is by a second hand: that of Bessarion, for whom the copy was made.²¹ In codex B (c. 1480 A.D.), ἰδρῶς is again added by a second hand in the lacuna: this time without δὲ. The addition postdates the copy of B from which codex H descends, so that H exhibits the lacuna without supplement, either in the margin or in the text.²²

²¹ Burnikel p. xxviii, 44.

²² On the relation between codex B and codex H, see Burnikel p. 16–19, and on the different stages in the correction of codex B, see p. 25–31. Burnikel leaves open the ques-

1.2–4 πότερον μεθ' ὑγρότητος εὐθὺς ἐκκρινομένης γίνεται ἢ πνεύματος ὡς τούτου διϊόντος διὰ τῆς σαρκὸς εἴτ' ἔξω πῆγνυται καὶ συνίσταται καταψυχόμενον] Here Theophrastus asks a fundamental question which will be answered elsewhere. (See the note on 1.4.) The question is “whether sweat occurs straightway with moisture when it is secreted, or (with) breath since this (the breath) passes through the flesh and then on the outside becomes thick and condensed through cooling.” Judging by what is said later in the treatise, Theophrastus is prepared to accept both possibilities. In discussing the saltiness of sweat, he treats sweat as moisture secreted from within the body (it is compared with urine, phlegm and tears 2.10, 3.17). That is the first possibility; if breath plays a role, it is as an efficient cause of secretion (2.12–13).²³ But in discussing nausea, he tells us that the breath which is proper to men becomes sweat outside the body (38.238–9).²⁴ That appears to be the second possibility; breath passes through the flesh and condenses on the surface.

The text printed in this edition (that of the lemma) is problematic in at least four places. The first concerns the preposition μεθ'. Grangerius emends the text to read ὑφ', translates with *ex* and in his notes argues that the question posed by Theophrastus concerns the source from which sweat arises: *quaeritur an sudor ex humore ortum habeat, an vero ex spiritu*.²⁵ Apparently Grangerius emends to ὑφ', because he thinks that the letters and abbreviated form are close to μεθ'; but his translation and note suggest reading ἐξ. Furlanus makes the suggestion explicit in his note,²⁶ Schneider records the suggestion of Furlanus,²⁷ and Wimmer prints ἐξ in both of his editions. The emendation is not foolish, but it is unnecessary. In context, the preposition μετά (μεθ') is intelligible and perhaps preferable, for in one of its uses it signifies simultaneous occurrence.²⁸ Theophrastus uses the preposition here, because he begins by asking whether sweat occurs straightway, εὐθὺς, with moisture when it is secreted. That possibility con-

tion whether the corrections in B are attributable to one or more hands.

²³ At 2.12–13, breath is mentioned together with heat; they provide the force, δύναμις, on account of which sweat is secreted. Cf. 30.194–6, where sweat is said to be “a certain liquefaction, as of badly made additions to the flesh, when (the additions) are secreted on account of heat.”

²⁴ Theophrastus goes on to explain that when breath becomes cool and moist within the body, then it causes nausea (38.239–40).

²⁵ Grangerius fol. 1^r – 3^r.

²⁶ Furlanus p. 240.

²⁷ Schneider vol. 4 p. 779.

²⁸ See Aristotle, *Topics* 6.13 150b36, 151a1.

trasts with the second: namely, that sweat occurs only after breath has passed through the flesh (εἴτ', "and then"). If there is an awkwardness, it is understanding μετά with πνεύματος at the beginning of the second possibility. Here ἐξ might be better, but the awkwardness is tolerable: no preposition is used, and that suits the abbreviated style of *On Sweat*.

The second problem concerns the words ὥς τούτου. In his notes, Schneider suggests reading τοῦ συμφύτου,²⁹ and Wimmer, in both his editions, prints συμφύτου without τοῦ. The change is not necessary, for the text as transmitted by codex A is intelligible: ὥς signals an explanation and τούτου refers back to πνεύματος. Theophrastus is asking whether sweat is attributable to breath which passes through the skin and then condenses on the outside. More important, the change introduces an explicit reference to connate breath (connate *pneuma*), and that suggests relating Theophrastus' remarks concerning breath to the Aristotelian doctrine of connate breath.³⁰ The suggestion is interesting, for in Aristotle's biology connate breath is a special element which serves to explain generation, locomotion and sense perception. Theophrastus will have expanded the functions of connate breath to include sweating, and in so doing he will have taken a significant step in the direction of the pseudo-Aristotelian work *On Breath*. For Aristotle appears to concentrate connate breath in the region of the heart (*Movement of Animals* 10 703a11–16), but sweating occurs over most of the body,³¹ and in *On Breath*, connate breath is said to extend throughout the entire body (2 481b19, 3 482a23).³² Moreover, in asserting that the secretion of breath is continuous (2.14–15), Theophrastus will have rendered imperative a discussion referred to by Aristotle (*Movement of Animals* 10 703a10–11) and taken up by the author of *On Breath* (1 481a1): namely, how connate breath is maintained. But having acknowledged the

²⁹ Schneider vol. 2 p. 610.

³⁰ For discussion of the Aristotelian doctrine, see, e.g., A. Peck, *Aristotle, Generation of Animals* (London: Heinemann 1942; rev. 1953), App. B p. 576–93; A. Preus, *Science and Philosophy in Aristotle's Biological Works* (Hildesheim: Olms 1975), 86–91, 113–18, 143–9 and M. Nussbaum, *Aristotle's De Motu Animalium* (Princeton: Princeton University Press 1978), 143–64.

³¹ Men sweat from top to bottom, or head to foot: see *On Sweat* 9.53, 33.207–8, 211 (head) and 36.226 (foot). Since breath is a factor in sweating, it would seem that breath is present throughout the body. But that is not at issue (cf. Theophrastus' account of paralysis in text 346.3–10 FHS&G). What is at issue is whether Theophrastus' account of sweat involves connate breath.

³² See Roselli (1992) p. 81. Whether and to what extent Aristotle wishes to concentrate connate breath in the heart is a matter of scholarly debate. See Sharples p. 2, 28–9 and the literature to which he refers.

interesting consequences of the emendation suggested by Schneider and printed by Wimmer, I want to underline that the emendation is unnecessary. Neither here nor elsewhere in *On Sweat*, is there an explicit reference to connate breath,³³ and most of what is said by Theophrastus can be understood apart from the Aristotelian doctrine of connate breath.³⁴

The third problem concerns διῦόντος, which is an emendation; codex A has διῦέντος.³⁵ If we adopt the reading of A, breath is said to drive some unnamed stuff through the flesh.³⁶ The preceding mention of moisture (ὕγρότητος) suggests that we understand “moisture,” but given the subsequent mention of condensation through cooling, it seems better to understand “vaporized moisture.” Theophrastus would then be saying that breath drives vaporized moisture through the skin, after which the vaporized moisture condenses and becomes sweat. That is an intriguing possibility, but no subsequent passage in *On Sweat* can be said to support the idea, and at least one passage clearly speaks for the emendation, διῦόντος. That passage is 38.238–9: τὸ πνεῦμα τὸ ἴδιον καὶ ἔξω γινόμενον ἰδρώς. The expression is concise but also straightforward. Without any mention of breath driving out some unnamed stuff, Theophrastus tells us that breath becomes sweat on the outside. The parallel passage in the ps.-Aristotelian *Problems* 2.18 is fuller: τὸ πνεῦμα διῦόν ἔξω γινόμενον ἰδρώς διὰ τὴν ψύξιν (868a7–8). Here διῦόν occurs instead of ἴδιον, and that has encouraged editors to emend the text of *On Sweat* 38 to read διῦόν. I doubt that the emendation is justified,³⁷ and the addition of διὰ τὴν ψύξιν in *Problems* 2.18 suggests that the author of the that passage has been influenced by *On Sweat* 1.3–4: διὰ τὴν ψύξιν reflects καταψυχόμενον just as διῦόν reflects

³³ The same can be said of the other two physiological *opuscula*: *On Dizziness* and *On Fatigue*. In the former *opusculum*, πνεῦμα ἀλλότριον (1) is not connate breath gone astray, but rather vaporized fluids or inhaled breath or both, which are out of place and excessive (τι πλεόν ἀλλότριον 1, cf. 12). In the latter, the reference to ὁ πνευματικὸς τόπος (12) does not introduce connate breath; Sollenberger’s translation, “the region of the lungs,” is correct.

³⁴ In notes to 25.167 and 34.216–17, I suggest ways in which one can see connate breath behind the text, but I do not claim that Theophrastus would endorse the suggestions, and still less that he had the suggestions in mind when he wrote the passages in question. In a note to 38.238–40, I rule out construing ἴδιον πνεῦμα as connate breath.

³⁵ In both his editions, Wimmer follows Schneider and prints διῦόντος. At first glance, it may appear that codex D has διῦόντος, but in fact it has διῦέντος. The epsilon simply lacks the middle bar, as it does in, e.g., ἐν at 2.9.

³⁶ The omission of an object after διῦέντος is a difficulty and grounds for suspicion, but the text of *On Sweat* is often elliptical, so that omission does not in itself demonstrate corruption. See, for example, the notes on 19.128–9 and 34.220–1.

³⁷ See the note on 38.238–40.

διϋόντος, assuming that was the original reading in *On Sweat* 1.3. Be that as it may, there is a second passage in *On Sweat* which may be thought to support the reading διϋόντος. The passage is 26.175–9, where Theophrastus speaks of breath cooling and becoming sweat. The first part of the passage involves corruption, but it appears that Theophrastus speaks of breath being separated from what is moist on account of heat and being brought to the surface through the pores.³⁸ In the second part, Theophrastus says that when exertions stop and heat ceases, there arises from the breath as it cools that moisture which is called sweat. The parallel text in *Problems* 2.20 is not corrupt. We read that heat from motion causes moisture to become breath on the surface of the body; and that when exertions stop and heat ceases, the moisture which is called sweat arises from the breath which is thickened (868a20–5). Taking this text together with *On Sweat* 26, it appears that again we have support for reading διϋόντος and for the idea that breath goes through the flesh and becomes sweat through condensation. Nevertheless, the two passages are not entirely parallel, for *Problems* 2.20 omits what comes last in *On Sweat* 26: namely, that the result of breath becoming sweat is that the latter flows out in greater amount and more freely: ὥστε καὶ πλεῖον καὶ ῥᾶον ἐκπίπτειν (26.179). That suggests internal cooling after which moisture flows out as sweat.

At one time I thought that support for the reading of codex A could be found in the Hippocratic corpus. I cite two passages. First, the treatise *On Regimen* 2.64 says that restraining the breath can force open the pores, thin the skin and drive out moisture: πνεύματος δὲ κατάσχεσις τοὺς πόρους διαναγκάσαι καὶ τὸ δέρμα λεπτῦναι καὶ τὸ ὑγρὸν ἐκ τοῦ δέρματος ἐξῶσαι δύναται. Here breath is treated as a driving force and that harmonizes with the reading of codex A, διϋέντος. But there is no hint of condensation on the surface. In fact, the passage fits well with the first possibility mentioned by Theophrastus. Moisture is secreted (1.2), and breath is a force within the body (2.12–13). The second passage is *On Diseases* 1.25, where liquefied phlegm and bile are said to be thinned by heat, to become vapor and to pass out of the body mixed with breath: τὸ δὲ ὑπὸ θερμασίης λεπτυνόμενον ἀτμὸς γίνεται καὶ σὺν τῷ πνεύματι μισγόμενον ἔξω χωρέει. The mention of bodily fluids being vaporized and breath passing out of the body does invite comparison with *On Sweat* 1.3–4, but there are also significant differences. In particular, the Hippocratic text speaks of vapor being mixed with breath, while codex A has breath driving out va-

³⁸ See the note on 26.175–7.

porized moisture. In addition, the Hippocratic text makes no mention of breath or vapor or both becoming sweat through condensation on the surface; in fact, this mix of breath and vapor is contrasted with sweat which is secreted without being vaporized.³⁹ Hence, I do not find either of the Hippocratic texts close enough to support the reading διϊέντος. For that reason, as well as considerations advanced in the preceding paragraph, I think it best to read διϊόντος. Theophrastus is offering an alternative to secreted moisture: one in which breath passes through the flesh (διϊόντος διὰ τῆς σαρκὸς) and then condenses outside the body on the surface of the skin.⁴⁰

The fourth problem is the occurrence of a genitive absolute, τούτου διϊόντος, in which the subject is the same as that of the main verbs in its clause: i.e., πῆγνυται and συνίσταται. Normally the subject of a genitive absolute is not the same. Here, however, the demonstrative pronoun τούτου is neuter, referring to the preceding πνεύματος, and the neuter participle καταψυχόμενον—that is the reading of codex A—suggests that the subject of the main verbs is also πνεῦμα. It is, of course, true that the Aldine edition and those of Grangerius, Furlanus, Heinsius and Wimmer (the second edition only) all have καταψυχόμενος, masculine singular,⁴¹ so that the subject of the main verbs is ἰδρώς. But πνεῦμα makes better sense: it is not sweat which is cooled; rather, it is breath which is cooled and so condenses and becomes sweat on the surface of the body. Moreover,

³⁹ See also *On Diseases* 4.45, where the moisture which becomes vapor and escapes the body is carefully distinguished from both the moisture which flows into the intestines and bladder, and the moisture which is secreted as sweat. For additional references to the Hippocratic treatises and for commentary see Armelle Debru, *Le corps respirant*, p. 188.

⁴⁰ In regard to moisture appearing on the surface of the body as a result of condensation, it may be helpful to compare what Aristotle and Theophrastus say about dew. In *Meteorology* 1.10, Aristotle tells us that the heat of the day causes the moisture of the earth to evaporate. It rises, but not far, because the heat causing it to rise is small compared to the amount of water being raised. At night cooling occurs, the vapor condenses, falls and appears as moisture on the surface of the earth (347a13–35). A similar account of dew is found in Theophrastus' *Meteorology* 11. That work survives only in Syriac and Arabic, which are beyond my competence, but Hans Daiber's English translation makes clear that Theophrastus spoke of vapor rising in the lower region of the air, becoming thick on account of coldness and then descending ("The *Meteorology* of Theophrastus in Syriac and Arabic Translation," in *Theophrastus: His Psychological, Doxographical, and Scientific Writings* = Rutgers University Studies in Classical Humanities 5, ed. W. Fortenbaugh and D. Gutas [New Brunswick: Transaction 1992], 267). Similarly with sweat, heat causes bodily moisture to vaporize and to pass out of the body. In the air it is cooled, condenses and becomes moisture on the surface of the body.

⁴¹ The reading occurs first in codex B, where it is a correction *supra lineam*. See Burnikel p. 27.

normal usage admits exceptions, and in the case of the genitive absolute, exceptions in regard to the subject are found elsewhere in *On Sweat* and in other writings of Theophrastus.⁴²

A final observation: the verb συνίστασθαι occurs twice in this edition. Here it is the reading of codex A; it describes breath which condenses and becomes sweat. At 39.247, it is an emendation; it is used of secretions which collect on the surface of the body.

1.4 ἕτερος ἔστω ἐν ἄλλοις λόγος] The last word in the lemma, λόγος, is a correction first found in codex B *supra lineam*. It occurs in the same place in codex S⁴³ and is printed as part of the text in the Aldine edition. Codex A has λόγοις. Reading λόγος and not λόγοις gives a better text. I have, however, accepted the reading with hesitation, for awkwardness is common in *On Sweat*. In any case, deciding between λόγος and λόγοις does not affect the interpretation of the passage. For either we print λόγος and understand λόγοις with ἄλλοις, or we print λόγοις and understand λόγος with ἕτερος.

The question whether sweat occurs with secreted fluid or condensed breath is to be discussed elsewhere, ἐν ἄλλοις. It seems clear that Theophrastus is not referring to a later portion of *On Sweat*; rather he is indicating his intention to discuss the subject in a different treatise or course of lectures. We may compare the use of ἐν ἄλλοις in other treatises: e.g., in *On Stones* 1, the phrase refers to the lost work *On Metals* (137 no. 20 FHS&G),⁴⁴ in *On Fire* 76 it refers to a lost work like *On Hot and Cold* (137 no. 12),⁴⁵ and in *Research on Plants* 4.4.14 and 7.9.3 it refers to *opuscula*, which were originally independent and only later combined to form Book 9 of *Research on Plants*.⁴⁶ Similarly in *On Sweat*, the phrase

⁴² See *On Sweat* 34.218–19 with the note *ad loc.*; for examples in other writings, see *Metaphysics* 8 5a24–5, with the note of André Laks and Glen Most in the Budé edition (1993) p. 35–6 n. 41, and text 709.8–9 FHS&G = Athenaeus, *The Sophists at Dinner* 6.79 261E, with my commentary on the text, forthcoming in the Brill commentary volumes.

⁴³ Burnikel p. 26 cites the reading of codex S (omicron occurs above the second syllable of λόγοις) as evidence that S was copied from B (it too has an omicron above the second syllable) after B had undergone correction and therefore after H, or rather an intermediary, was copied from B. For although H is dependent on B, it does not exhibit the correction. See above, note 22.

⁴⁴ Eichholz p. 87.

⁴⁵ Coutant p. 66 lists five possibilities: *On Hot and Cold*, *Physics*, *On Stones*, *On Colors* and *On Wind*.

⁴⁶ See Amigues p. 198, who makes clear that Book 9 is a composite of two *opuscula*: 9.1–7 = *On the Saps of Plants*, and 9.8–19 (20) = *On the Power of Roots*. At 4.4.14 the phrase ἐν ἄλλοις refers to the work on saps, and at 7.9.3 it refers to the work on roots.

appears to refer to an independent work, and that may be true despite a temporal difference. In *Research on Plants*, Theophrastus uses the perfect passive indicative to refer to what has already been said (εἴρηται); in *On Sweat*, he uses the present imperative to announce discussion in another place (ἔστω). It is tempting to say that the announced discussion had not yet been composed—it is to be or will be composed (that is one way to construe the imperative)—but that is not certain. The present imperative may be no more than the lecturer’s way of referring to a different lecture or course of lectures, which has already been given in the past and will be repeated in the future, perhaps on a regular basis.

No surviving work of Theophrastus contains the announced discussion. Is there a lost work to which Theophrastus may be referring? Scholars have long suggested Περὶ ἐκκρίσεως, *On Secretion* (Diogenes Laertius 5.46 = 1.194 and 328 no. 14 FHS&G).⁴⁷ The suggestion is sensible not only because sweat is a form of secretion, but also because an adequate discussion of the sources of sweat is likely to make reference to other forms of secretion.⁴⁸ As a result, the announced discussion will have been well suited to a work broadly concerned with secretion in its various forms, and *On Secretion* is likely to have been such a work, even though the title contains the singular, ἐκκρίσεως, rather than the plural, ἐκκρίσεων.⁴⁹

1.5–6 διότι δὲ . . . νῦν δὲ] The Aldine and all subsequent editions omit the second δὲ. I have followed codex A and printed the second δὲ, for it seems possible to construe the repetition of δὲ as a form of emphasis. Having postponed discussion of one question, Theophrastus turns to a second question (or series of questions) which will be discussed at this time. The first δέ marks the turn, and the second, in combination with νῦν, adds emphasis. See Denniston, *s.v.* δέ II.4 p. 183, and below, the notes on 20.135–6 and 28.186.

1.5 ἢ τὰς ἄλλας ἔχων διαφορὰς] Theophrastus has just said that it is time “to consider why (sweat) is salty or acidic or has bad odor.” Now he adds “or possesses other differences.” The use of “or” three times does not

⁴⁷ The suggestion goes back at least to Grangerius, f. 3^v. See also Usener p. 9, Regenbogen col. 1405, Sollenberger p. 257, 310 and Sharples p. 7.

⁴⁸ In *On Sweat*, Theophrastus frequently refers to other kinds of secretion: urine at 2.10, phlegm and tears at 3.17, feces at 10.67–8, and ulcers and generally all the eruptions of the skin at 13.83 and 14.89–91.

⁴⁹ See the note on 1.1.

indicate four distinct topics, for the reference to acidity is a reference to acidic odor, and that is included within the larger discussion of bad odors (5.30). Perhaps then the reference to other differences at 1.5 is no more than an acknowledgment that the later discussion of bad odor will cover several different smells. We may compare the beginning of the discussion, where Theophrastus lists bad odor, no odor, acidic odor, and other kinds of bad odor (καὶ ἄλλοι δὲ τρόποι τῆς κακωδίας 5.30–1). The other kinds referred to here include those caused by eating rue and certain myrrh oils (5.35, 10.61). Nevertheless, there is another interpretation which seems to me equally possible. It is that at 1.5 Theophrastus adds a reference to other differences, because he intends to do more than discuss the saltiness and bad odor of sweat. At very least he may be thinking ahead to the discussion of varieties of sweat during a single episode (11.69–12.82). Indeed, I am inclined to accept this interpretation, because the mention of bad odor after acidity seems to sum up the subject of odor, after which a reference to other topics is in order.

1.6 πειρατέον θεωρεῖν] Cf. the excerpt from Theophrastus' *Physics* preserved by Simplicius: πειράσθαι χρῆ θεωρεῖν (*Commentary on Aristotle's Physics* 1.1 184a16–b14 [CAG vol. 9 p. 20.24] = 143.7–8 FHS&G). χρῆ θεωρεῖν occurs below at 14.95. Cf. also *On Fire* 10 πειρατέον . . . λέγειν.

2.7–8 πρὸς φύσιν τῆς σαρκὸς] The lemma is the reading of codex A. In the translation, following a suggestion of Armelle Debru,⁵⁰ I have taken the phrase closely with τὸ ἄλλότριον: “what is foreign to the nature of flesh.” The idea is straightforward. When food is taken in, some of the matter is suited to the nature of flesh,⁵¹ and some is not. The former is what is sweetest and lightest; it is assimilated and becomes flesh. The latter is salty; it cannot be assimilated and therefore must be secreted.⁵² In a note to the translation, again following Debru,⁵³ I offer an alternative translation which keeps the Greek word order—τὸ ἄλλότριον ἐκκρίνεται πρὸς

⁵⁰ In private correspondence, Armelle Debru has suggested to me the following translation: “ce qui est étranger par rapport à la nature de la chair.”

⁵¹ Cf. Theophrastus' use of πρὸς τὴν φύσιν at *Plant Explanations* 3.6.6: ἐκατέραις γὰρ ἡ τροφή πρὸς τὴν φύσιν σύμμετρος, “for each of the two varieties (of vine) the food is suitable to its nature.”

⁵² Concerning the sweet and the salty, cf. Aristotle, *Meteorology* 2.2 355b6–11, *On Senses and Sensible Objects* 4 442a1–12 and *On Generation of Animals* 4.8 776a28–30.

⁵³ Debru (above, note 50) also suggests the following translation: “ce qui est étranger est sécrété en relation avec la nature de la chair.”

φύσιν τῆς σαρκὸς—and gives the phrase in question more of a final force: “what is foreign is secreted in view of the nature of flesh.”⁵⁴

In codex A, a semi-colon (raised dot) separates the phrase πρὸς φύσιν τῆς σαρκὸς from what follows.⁵⁵ That is consistent with the preceding interpretation. In contrast, Schneider has no punctuation after πρὸς φύσιν τῆς σαρκὸς. He introduces a comma before the phrase, and he is followed by Wimmer.⁵⁶ That is not impossible. What is sweetest and lightest is indeed consumed with a view toward the nature of flesh. But taking the phrase with what precedes, i.e., with τὸ ἀλλότριον ἐκκρίνεται, not only gives an equally good or better construction⁵⁷ but also finds support in the parallel passage in *Problems* 2.3. There the corresponding phrase, ἐν τῇ προσφύσει τῆς τροφῆς πρὸς αἷμα καὶ τὰς σάρκας, occurs in connection with the secretion of what is foreign: ἀποκρινούσης ὅσον ἀλλότριον ἔνεστιν ἐν τῇ προσφύσει κτλ. (866b20–1). Mention of what is sweetest and lightest comes later (866b23–4).

In the preceding two paragraphs, I have taken the word φύσις to refer to the essential nature or constitution of flesh. That is, I think, correct, but it should be observed that in the present context, φύσις might have the meaning “natural growth.” To be sure, φύσις in this sense is not common, but see LSJ s.v. I.2, where the meaning “growth” is recorded and reference is made to Hippocrates, *On the Nature of Infants* 20, 27 and 29. In the last two places, Joly (Budé) translates φύσις with “croissance naturelle” or simply “croissance.” Hence, it seems possible—albeit not preferable—to translate 2.7–8 as follows: “what is foreign is secreted with a view to the natural growth of flesh.”

The phrase πρὸς φύσιν τῆς σαρκὸς is found in neither Photius nor the *Problems*. The former has τῇ προσφύσει τῆς σαρκὸς (278 528b30), and the latter ἐν τῇ προσφύσει τῆς τροφῆς πρὸς αἷμα καὶ τὰς σάρκας (2.3 866b21). The occurrence of the word πρόσφυσις in both places is striking and some reason for suspecting that Theophrastus may have written (ἐν) τῇ προσφύσει and not πρὸς φύσιν. If Photius alone or the writer of *Problems* 2.3 offered (ἐν) τῇ προσφύσει, we might speculate that he was influ-

⁵⁴ Secreting what is foreign may be viewed as a means πρὸς τὸ τέλος.

⁵⁵ Codex D has a period after the phrase. Codex B has a comma before the phrase and a period after it.

⁵⁶ Strictly speaking that is only true of Wimmer’s second edition (1866). In his first edition (1862), he prints ἐν τῇ προσφύσει τῆς σαρκὸς, but he does put a comma before the phrase.

⁵⁷ I am agreeing with Debru who suggests that letting the subsequent genitive absolute begin with ἐξαναλωμένου gives the better construction.

enced by the appearance of the same two words at 4.24. But it is difficult to explain how both writers—each independently of the other—changed πρὸς φύσιν to (ἐν) τῇ προσφύσει. Perhaps each worked with a text of *On Sweat* which exhibited (ἐν) τῇ προσφύσει. But if so, which of the two better reflects the Theophrastean original?

Forster, who is commenting on the first edition of Wimmer, tells us that the reading ἐν τῇ προσφύσει τῆς σαρκὸς does not give the required sense.⁵⁸ He recommends emending the Theophrastean text on the basis of the *Problems*: i.e., reading ἐν τῇ προσφύσει τῆς τροφῆς πρὸς αἷμα καὶ τὰς σάρκας. That produces a clear text. Two sections later, the word πρόσφυσις seems to refer to the natural assimilation of food by the body (4.24);⁵⁹ and if it is read in the passage under consideration (2.7–8), it would seem to have the same meaning, i.e., it would refer to “the process by which nourishment passes into blood and the flesh.”⁶⁰ In contrast, the text of Photius may seem less clear and even confused, for it is not the assimilation of flesh, πρόσφυσις τῆς σαρκός, which is in question. Rather it is the assimilation of food resulting in flesh.

Against the emendation of Forster, it may be argued that the emendation appears to be an expansion of what Theophrastus wrote, and that parallels in the *Problems* do not represent an alternative manuscript tradition. They are, however, important when they confirm a reading occurring independently in Photius, which is the case at *On Sweat* 2.7–8: i.e., τῇ προσφύσει as against πρὸς φύσιν. That is the view of Antonio Battagazzore, who holds that τῇ προσφύσει gives what we expect: a reference to the “increase” of flesh and not to the “nature” of flesh.⁶¹ Through the increase or growth of new flesh, what is sweetest and lightest is consumed.⁶² In addition, Battagazzore explains how τῇ προσφύσει may have been corrupted into πρὸς φύσιν. The ending of the immediately preceding

⁵⁸ Forster, *Further Emendations*, p. 141. The reading of Wimmer, ἐν τῇ προσφύσει τῆς σαρκὸς, is peculiar in that ἐν seems to be taken from the *Problems* and τῆς σαρκὸς from Photius, but that does not affect the point at issue: whether τῇ προσφύσει followed by the genitive τῆς σαρκὸς gives the required sense.

⁵⁹ Cf. the use of the cognate verb at *Problems* 1.42 864b8: τὸ μὲν γὰρ πεφθὲν ὑπὸ τῆς φύσεως, τοῦτο προσφύεται τοῖς σώμασι καὶ καλεῖται τροφή, and 21.2 927a20–1: προσφῦναι γὰρ δεῖ (sc. τὴν τροφήν) καὶ προσκολληθῆναι τῷ σώματι.

⁶⁰ That is Forster’s translation of the emended text based on *Problems* 2.3. Although Forster does not say so explicitly, it is clear that he is following Wimmer and taking the words in question closely with what follows: it is “in the process by which nourishment passes into blood and the flesh” that “what is sweetest and lightest has been consumed.”

⁶¹ In private correspondence, Battagazzore explains πρόσφυσις as “accrecimiento.”

⁶² Like Forster, Battagazzore is taking the words in question with what follows.

word, ἐκκρίνεται (TAI), will have caused a scribe to omit τῇ, i.e., τῇι (THI), after which προσφύσει was changed to πρὸς φύσιν.

The preceding explanation of corruption is attractive; what may cause concern is the meaning assigned to the phrase τῇ προσφύσει. For even if we dismiss the worries of Forster and say that the phrase τῇ προσφύσει τῆς σαρκὸς can be understood as an elliptical expression meaning “through the assimilation of <food which becomes> flesh” or simply “by the additional growth of flesh,” it may be that here at 2.7–8 the phrase has a different meaning. In particular, the use of πρόσφυσις may involve a contrast with σύμφυσις: attachment as against assimilation. Suzanne Amigues has pointed out to me that this contrast is neatly illustrated by *Research on Plants* 9.2.6, where Theophrastus is discussing trees which have been tapped for resin. In such cases, the tap-hole cannot be healed through σύμφυσις, the growth of new wood which forms a homogeneous union with the wood of the tree around the hole. Rather, there is πρόσφυσις, the attachment of resin to the damaged wood. Similarly in *On Sweat*, Theophrastus may use the phrase τῇ προσφύσει τῆς σαρκὸς, because he is thinking of incomplete digestion, which achieves attachment without homogeneous union.⁶³ He mentions flesh, σάρξ, not only as a reference to the end toward which the nutritive process tends, but also because he has in mind cases in which food becomes badly formed flesh, such that it adheres to but fails to become one with well-formed flesh. We may compare *On Sweat* 30.194–6, where Theophrastus calls sweat “a certain liquefaction, as of badly made additions (τῶν κακῶς προσωκοδομημένων) to the flesh, when (the additions) are secreted on account of heat.” Here Theophrastus uses a metaphor from the building of houses: the addition is not mere rubble, nor is it well integrated, and as a result it is readily removed. So too with sweat, there are times when badly formed flesh attaches itself to the existing flesh; it fails to form a homogeneous union, undergoes liquefaction and is secreted as sweat. The idea here is clear enough; the only question is whether it gives a correct interpretation of 2.7–8. I hesitate to say that it does, for it is not immediately clear how the dative, with or without τῇ, is to be construed, and the occurrence of τῇ προσφύσει at 4.24 speaks

⁶³ By the 2nd century A.D., πρόσφυσις had become a *terminus technicus* referring to a middle step in the nutritive process. See Galen, *On Natural Faculties* 1.11, where three steps are clearly distinguished: first, there is πρόσθεσις, the presentation of nutriment; second, πρόσφυσις, the adhesion of the nutriment; and third, ἐξομοίωσις, the assimilation of the nutriment to the body. To illustrate attachment which fails to be followed by assimilation, Galen mentions white leprosy.

for a different interpretation. In the later passage—which is still within the discussion of the saltiness of sweat—πρόσφυσις seems to be used of the natural and successful assimilation of food, and not of mere attachment to existing flesh. Such a shift in meaning within such a short space is, of course, possible, but it is hard to accept.⁶⁴

The conclusion of this note may be a frank expression of frustration. There is good reason to prefer the reading of either Photius or the *Problems*, but deciding between them or some combination of the two is not easy. Moreover, if τῇ προσφύσει is read, we are faced with alternative interpretations, each having its own appeal. In contrast, the reading of codex A presents fewer difficulties. In fact, the text is not only intelligible but also economical, which is what one expects in a treatise characterized by brevity of expression. Nevertheless, it appears to be the *lectio facilior*, and may represent an attempt to correct a corrupt text. I am, therefore, tangled in *aporia*; with reservation and hesitation I have printed πρὸς φύσιν τῆς σαρκὸς and recorded proposed emendations in the *apparatus criticus*.

2.9 τὸ . . . τοιοῦτον] “Foreign matter” has been added to the translation, for τὸ . . . τοιοῦτον seems to pick up τὸ ἀλλότριον in 2.7. However, the excerpt of Photius has τὸ . . . τοιοῦτον περίττωμα, “such residue” (528b31).

2.9 ἐν μὲν τῇ ὑποστάσει τῇ κατὰ τὴν κύστιν] I have translated “when it accumulates as waste in the bladder.” A more literal translation might be “(when it occurs) in the waste accumulated in the bladder.” The noun ὑπόστασις is cognate with the verb ὑφίστασθαι in 2.12. It can be used of solid as well as liquid residues which are discharged by the body.

2.10 οὔρον . . . ἰδρῶς] Cf. Aristotle’s *Meteorology* 2.3, where urine and sweat are mentioned together. Aristotle makes clear that he is concerned with residue in the body (357b8, 358a6). In the case of sweat, he speaks of residue which is secreted from the flesh, being washed out of the body, as it were, by moisture on its way out (357b5–7, cf. 358a12).

In 2.9–10, we are told that when foreign matter accumulates in the bladder it is called urine, and when it accumulates in the flesh, ἐν τῇ σαρκί, it is

⁶⁴I do not want to suggest that within a short space the same word is never used in two quite different senses. It may be. A clear example is the use of πνεῦμα at 38.236 and 238 to mean first “wind” and then “breath.” Nevertheless, πνεῦμα is a common word and the uses are not unusual. In contrast, πρόσφυσις is far less common and the uses are specialized. A shift in meaning without clear indication is a more serious (confusing) matter.

called sweat. From the perspective of modern physiology, we would expect a reference to glands rather than to flesh.⁶⁵ They correspond more closely to the bladder, and in the case of eccrine glands, the presence of sodium chloride can explain the saltiness of sweat, which is Theophrastus' concern here in sections 2–4. But *On Sweat* contains no mention of glands, and the reference to flesh corresponds to what Aristotle says in *Meteorology* 2.3.

2.11 οἶον αὐτῆς τῆς φύσεως ἐργαζομένης] Here οἶον acknowledges the boldness of the expression which follows: “with the nature (of the body) itself doing the work.” The boldness resides primarily in ἐργαζομένης, “doing the work,” for φύσις is often used of the natural constitution or disposition of the body or some part thereof; cf. 2.8 and 18.121. For a similar use of οἶον, see 30.195 and the note on 30.194–6.

2.12 ὑφίστασθαι] Here the Aldine edition has ὑφίσταται. That is not just an unnecessary change; rather it is one that confuses the construction of the Greek sentence. The main verb is συμβαίνει, which governs two infinitive clauses: one with ὑφίστασθαι and a second with ἐκκρίνεσθαι. The reading of the Aldine will not be found in the *apparatus criticus*.

2.12–13 τὸν ἰδρῶτα δ' ἐκρίνεσθαι διὰ τὴν κίνησιν ἢ πόνον ἢ ἀπλῶς τὴν τοῦ θερμοῦ καὶ πνεύματος δύναμιν] Here Theophrastus is thinking of the first possibility mentioned in 1.2: sweat occurs straightway with moisture when it is secreted. The four causes listed here form two pairs. First Theophrastus mentions motion and exertion which are characteristic of bodily exercise.⁶⁶ Then he mentions two causes, heat and breath, which are integral to exercise. Concerning heat, cf. 30.196: (ὁ ἰδρῶς) ἐκρίνεται διὰ τὸ θερμόν. The heat in question is that which motion and exertion generate within the body; cf. 13.83–5.⁶⁷ The reference to breath is more problematic; for although Theophrastus often refers to breath, it is not always clear how we should understand the refer-

⁶⁵ The same may be said of 20.135–7, where Theophrastus considers persons who suffer a blockage in their intestines and bladder. The moisture which normally passes to these organs is said to be “carried up to the flesh (πρὸς τὰς σάρκας) and to the regions above.”

⁶⁶ Theophrastus is not saying that sweating is always the result of exercise. He is well aware that a bad bodily condition can result in sweating apart from motion and exertion. See 21.141–22.154.

⁶⁷ In a different context, “heat” may refer to external heat which produces motion within the body and in this way causes sweating; cf. 27.182–3.

ence. Here at 2.13, Theophrastus may be thinking of inhaled breath which is restrained during periods of motion and exertion. Inhaled breath is not confined to the lungs: in 33.212–13 it is said to extend to the head, and in 25.171–2 it is said to fill the pores. In the latter passage, we are told that filling the pores inhibits sweat, but in 34.216–21 Theophrastus tells us that restraining the breath makes us sweat more. Cf. the Hippocratic treatise *On Regimen* 2.64, where we are told that restraining the breath can force open the pores, thin the skin and drive out moisture.⁶⁸ Unfortunately no passage in *On Sweat* tells us how inhaled breath relates to the breath which arises within the body when moisture is vaporized. Perhaps Theophrastus thinks that there are cases in which inhaled breath and vaporized moisture work together to drive sweat through the flesh, or cases where vaporized moisture can accomplish the same work on its own. One thinks of sweating while sick, or sweating while asleep. The trouble is that when Theophrastus mentions such cases, he does not explicitly address our concern.⁶⁹

2.14–15 συνεχὲς δὲ ἦττον <ῆ> ἢ τοῦ πνεύματος ἔκκρισις] The lemma without the supplement ῆ is the text of codex A. It is found again in codex D. The particle δὲ is omitted in codex B. The omission recurs in the Aldine edition, where a comma is placed after συνεχὲς. Furlanus supplied ῆ before ἢ τοῦ πνεύματος ἔκκρισις. The supplement is simple, plausible (the occurrence of one eta after the other caused omission) and gives the words good sense. Theophrastus has just compared urine and sweat: urine collects automatically and at all times; in contrast, the secretion of sweat depends on several factors and does not occur at all times (2.10–14). Now Theophrastus adds that sweating is less continuous than the secretion of breath (2.14). The latter is like the collection of urine (2.13–14); it is always occurring (2.15).

In his notes (vol. 2 p. 610), Schneider proposed reading συνεχὲς δ'οὐχ ἦττον ἢ τοῦ πνεύματος ἔκκρισις. Wimmer printed the reading in both of his editions. That involves a shift in emphasis from sweating, which is no longer mentioned in the sentence, to breath. Moreover, “not less continuous” weakens the comparison in a potentially misleading way, for the secretion of breath is considerably more continuous than that of

⁶⁸The Hippocratic passage is quoted in the note on 1.2–4.

⁶⁹See, e.g., 13.83–6, where sweat is said to remove unhealthy residues. Here Theophrastus mentions heat but not breath. (The mention of exertion and motion in lines 83–4 makes one think of restraining inhaled breath.) At 40.248–50, where sweating during sleep is the subject, we again find a reference to heat but not to breath.

sweat. It is always occurring: καθάπερ ἀτμίζοντος ἀεὶ τοῦ σώματος, “the body is always, as it were, steaming” (2.15); cf. 19.129–31.

What is the breath to which Theophrastus refers? A possible answer is pneumatized or vaporized moisture (πνευματούμενον ὑγρόν).⁷⁰ That fits both the immediately following reference to invisibility and the subsequent image of a steaming body (2.15). However, in what immediately precedes, in 2.13, Theophrastus refers to breath, and in doing so he appears to be thinking of inhaled breath which is restrained during periods of exertion. (See the note on 2.12–13.) That certainly is reason for pause, but it would be wrong to think that two uses of πνεῦμα in close proximity must have the same reference. We need only compare section 38, where πνεῦμα is used first to refer to wind external to the body and then two lines later to breath within the body (236 and 238).

2.15 ἄφαντος δὲ τῇ αἰσθήσει] Codex A has ἄφατος, which is corrupt. I have printed ἄφαντος, which is the emendation of Grangerius. It gives good sense, but it is primarily poetic. Antonio Battegazzore has suggested to me that the words ἄφαντος δὲ τῇ αἰσθήσει should be printed between dashes to make clear that the phrase is parenthetical. See the next note.

2.15 καθάπερ ἀτμίζοντος ἀεὶ τοῦ σώματος] Here καθάπερ (“as it were”) appears to soften the image of a steaming body.⁷¹ But the appearance may be largely stylistic; for in scientific contexts, the noun ἀτμίς is often used for moist vapor and the cognate verb ἀτμίζειν for “giving off vapor” or “being vaporized.”⁷² I cite Aristotle’s *Meteorology* 1.10 347a13 (verb) and 347a19 (noun), for there the topic is the cause of dew, which invites comparison with the second cause of sweat given in 1.2–4.⁷³

⁷⁰ For the verb πνευματοῦν together with ὑγρόν, see, e.g., Aristotle, *On Respiration* 20 479b32 and ps.-Aristotle, *Problems* 37.3 965b39.

⁷¹ For καθάπερ used to introduce a comparison, see 25.172; for καθάπερ with a limiting, perhaps apologetic force, see 25.170–1.

⁷² The verb ἀτμίζειν has both a transitive and an intransitive use. See LSJ s.v. I and II.

⁷³ Theophrastus does not tell us how the continuous secretion of invisible breath (2.14–15) relates to the passage of breath through the flesh and subsequent condensation on the surface of the body (1.3–4). That may be disappointing; but in the context of section 2, the omission is not surprising, for here Theophrastus is discussing sweat in terms of the first alternative mentioned in 1.2. He tells us that the moisture which collects in the flesh is called sweat (2.10) and that this moisture is secreted on account of motion and exertion and the force of heat and breath (2.12–13).

3.16 (ἄλμυρόν δ' ὅτι) ἄπεπτον] Furlanus, Schneider and Wimmer print (ἄλμυρός δὲ ὅτι) ἄπεπτος. They understand ἰδρώς as subject. Since codex A has ἄπεπτον,⁷⁴ I have preferred to supply ἄλμυρόν δ' ὅτι, thereby maintaining the neuter. Cf. the supplement of Grangerius (see the the *apparatus criticus*) and the use of the neuter at 2.7, 9. In introducing elision, δ' ὅτι instead of δὲ ὅτι, I am influenced by, e.g., 3.18 and 8.47, where δ' ὅτι occurs. But such fine tuning—within a supplement—is otiose.

3.18–19, 21 ἀπὸ τῶν περὶ τὸν ἐγκέφαλον . . . κατὰ τὸν ἐγκέφαλον] Fluid surrounds the brain. Cf. *On Dizziness* 1: ὁ γὰρ τόπος ὁ περὶ τὸν ἐγκέφαλον φύσει μὲν ὑγρὸς ἐστίν. See also *On Sweat* 33.208–10, where the brain is said to be a sign of moisture.

3.19 φλέβος] Aristotle did not distinguish between veins and arteries; he used the noun φλέψ for both. Theophrastus appears to have done the same. That may be disappointing, for contemporaries of Theophrastus like Praxagoras, Herophilus and Erasistratus did distinguish between veins and arteries, and in the case of Erasistratus we are told that he was associated with Theophrastus, perhaps as his pupil.⁷⁵ But whatever the relationship, there is no evidence that Theophrastus departed from Aristotle and followed Erasistratus or one of the other medical writers in regard to veins and arteries. For that reason, I have followed translators of Aristotle and rendered φλέψ with (blood) “vessel,” which covers both veins and arteries.

4.22–8 ἡ τούτῳ μὲν μαρτυρεῖ—φανερῶς] In section 4, Theophrastus introduces a problem. He has already explained that sweat is salty, because it is a secretion of foreign matter which has not been assimilated by the body (sections 2–3). Now he connects increased saltiness with the natural assimilation of food and suggests that in such cases sweat would not be a secretion of what is useless. That creates a problem: Can it be that saltiness is attributable to what has (sec. 4) as well as to what lacks (sec. 2–3) nutritional value? So much is, I think, certain; but it should be recognized that the text of section 4 is difficult and perhaps seriously corrupt in lines 24–5.

⁷⁴ In fact, codex A has ἄπεπτοντο. Failure in word division is easily recognized; the final two letters constitute the definite article and begin a new clause or sentence.

⁷⁵ Galen, *Whether Blood is Naturally Contained in the Arteries* 7 (p. 17.1–5 Albrecht) = 47.1–4 FHS&G and Diogenes Laertius, *Lives of the Philosophers* 5.57 = 1.367–8 FHS&G. For some discussion of the medical writers, see Sharples p. 29 and David Furley's essay in *Galen, On Respiration and the Arteries*, ed. D. J. Furley and J. S. Wilke (Princeton: Princeton University Press 1984), 20–37.

4.23 τὸ πρότερον ὅτι ἰδρῶς πᾶς ἄλμυρός] Theophrastus has not used the adjective πᾶς (“all”) in the preceding sections of the treatise, but what is said at 2.7 (and supplied at 3.16) seems to imply that all sweat is salty.

4.24 τῇ προσφύσει] See the note on 2.7–8: πρὸς φύσιν τῆς σαρκὸς.

4.25 ἄλυσιτελοῦς] Codex A has ἄλυσίου. I have followed Schneider and printed ἄλυσιτελοῦς (“useless”). Also possible is ἄλυκοῦ (“salty”), printed by Grangerius and suggested by the occurrence of ἄλυκώτερος in line 24. In regard to the argument of section 4, either emendation will do. If sweat with increased saltiness is to be explained by reference to the natural assimilation of nourishment, then the sweat in question would not be a secretion of useless foreign matter (4.24–5), even though useless foreign matter is salty (2.7–10, 4.25–6).

4.26 πάλιν] Wimmer emends to πᾶν, which is attractive in view of 4.23: ἰδρῶς πᾶς ἄλμυρός, but the change is not necessary. We can read πάλιν and translate “again,” for Theophrastus is both picking up what has already been said and signaling a difficulty which calls for further investigation.

5.29–30 ἀκόλουθον δέ πως τούτων αἰτίας ἐστὶ καὶ σχεδὸν τῆς αὐτῆς καὶ ὅτι] The lemma reports what is printed in this edition. It is the text of codex A. The first genitive, τούτων, goes with ἀκόλουθον (see LSJ s.v. ἀκόλουθος 3). The second genitive, αἰτίας, goes with τῆς αὐτῆς. The first καὶ goes with σχεδὸν. As Bob Sharples has suggested to me, it intensifies or gives emphasis to σχεδόν (see LSJ s.v. καί B.4). Schneider’s proposed emendation, ἀκόλουθον δέ πως τούτοις ἐστὶ καὶ αἰτίας σχεδὸν τῆς αὐτῆς, may make the text easier to read, but it is not necessary. It is a typical enhancement of an often awkward text.

Schneider also proposes omitting the second καὶ. That too may give a simpler text, but again there is no need to change the text of codex A. Here καὶ means “also”; it picks up and reinforces the fact that “almost the same cause” will be introduced to explain bad odor. Theophrastus has already connected saltiness with lack of concoction (3.16) and is now going to refer bad odor as well to the same cause (5.31–2). The qualifier “almost” signals a difference between the accounts of saltiness and bad odor. In discussing the former, Theophrastus has emphasized the secretion of what is foreign (2.7, 4.26); in the case of the latter, he will place the emphasis on bad bodily condition (5.32–3, 36–7, 38–40). All bodies, even those which

are in good condition, do not (cannot) concoct and assimilate what is foreign, but when a body is in bad condition, it may fail to concoct suitable nutriment as well. The result is malodorous sweat.

5.30 ἄνοσμος] I have printed the reading of codex A. It is also printed in the Aldine edition and in those of Grangerius and Furlanus. The editions of Heinsius, Schneider and Wimmer have ἄοσμος. For the former, see LSJ s.v., where reference is made to Aristotle, *History of Animals* 10.1 634b19; for the latter, see LSJ s.v., where reference is made to Aristotle, *On Sense and Sensible Objects* 5 443a10 and Theophrastus *Plant Explanations* 6.16.5.

5.30–1 καὶ . . . δὲ] Cf. 6.40 and 21.143, and see Denniston, s.v. καὶ δέ: καὶ . . . δέ no. 2 iii, p. 202–3.

5.31–2 τῆς κακωδίας· ἄπτονται γὰρ ταῦτα . . . ἀπεψίας] In both punctuation and vocabulary, the lemma is the reading of codex A, except for the last word, ἀπεψίας. That is the reading of codex O; codex A has ἄπεψις. Grangerius, Furlanus and Heinsius prefer to take ἄπτονται with τῆς κακωδίας and therefore place the semicolon after ἄπτονται. In order that γὰρ may come second in its sentence, καὶ is supplied before γὰρ, and in order to create an intelligible sentence, ἀπεψία is read. That seems to me a case of overediting, so that I have followed Schneider and Wimmer and printed the text of codex A, as corrected in codex O.

5.32 κοιλίας] Here Theophrastus seems to use κοιλία especially of the stomach, but the word is used of the intestines as well: cf. 10.68, 19.126 and 20.133, 135.

6.35 συμβαλλόμενα] Here the middle voice is used of contributing factors or causes. See LSJ I.9, citing this passage. The contributing factors referred to are certain foods (5.33). The primary cause is a bad bodily condition and specifically a bad stomach (5.32–3).

6.36 καὶ τι ἄν] The lemma is the reading printed by Grangerius (*re vera* καὶ τὶ ἄν), Schneider and Wimmer (both editions). Codex A, the Aldine edition and that of Furlanus have καὶ τί ἄν. Schneider comments that ἄν seems superfluous.

6.37–8 γὰρ . . . ἐπεὶ] After telling us that food is a contributing factor and that the cause of bad odor ought to be assigned to the condition of the

body (6.35–7), Theophrastus supports this assertion by first mentioning and then eliminating a false impression. The supporting argument runs four lines (37–40) and is introduced by γάρ (37). The false impression is that many men who exercise and seem to be in good condition have a bad odor when they sweat (37–8). The falsity of this impression is indicated by “seem,” δοκούντων (37); it is made explicit in the subsequent remarks introduced by ἐπεὶ. Here ἐπεὶ is used elliptically. I have translated: “(but this is misleading,) since it is clear from many things that”⁷⁶ What follows is an inductive argument. The conclusion comes first: “(bad odor is caused) by the bad condition (of the body)” (38), and then three cases are adduced to support the conclusion (39–40).

6.39–40 ἐκ τῶν ἀφροδισιαζόντων πλείω ἔξιν ἐχόντων ἤδη]

Theophrastus mentions persons who are sexually active as well as persons who are either sick or convalescing, in order to make clear that malodorous sweat is caused by a bad bodily condition. From *Problems* 4.12 877b21–36, it appears that sexual activity produces malodorous sweat in men, because ejaculation results in a loss of the body’s natural heat: the concoction of semen requires so much heat that other juices remain unconcocted and therefore are salty and malodorous.⁷⁷

Grammatically πλείω can be either feminine accusative singular or neuter accusative plural. If it is feminine, then it modifies ἔξιν, and Theophrastus is referring to an “increased disposition” to secrete malodorous sweat. If it is neuter accusative, then it is used adverbially,⁷⁸ and Theophrastus is concerned with “rather frequent” sexual activity which results in cooling, lack of concoction and therefore foul smelling sweat. The latter interpretation suggests that occasional sexual activity need not result in malodorous sweat; it is only excessive activity which has that result. See 8.47–9, where Theophrastus tells us that adolescents are especially (μάλιστα) driven toward sexual activity. Perhaps it is adolescents whom Theophrastus has in mind here at 6.39–40.

In private correspondence, Daniela Manetti has remarked that ἤδη is difficult both in sense and position. She suggests τινὰ as an emendation.

⁷⁶The translation was suggested to me by Bob Sharples. A shorter and more idiomatic translation is possible: “and yet it is clear” Another possibility is “still, it is clear” On this use of ἐπεὶ see LSJ s.v. B.4.a.

⁷⁷In *Problems* 4.24 879a23–6, sexual activity and the resulting failure of concoction are again associated with bad smelling sweat. The passage is, however, problematic; see Flashar p. 466–7.

⁷⁸See LSJ s.v. πλείων A.II.2.d. I am indebted to Daniela Manetti for calling my attention to the adverbial usage.

The text would then become ἔξιν ἐχόντων τινᾶ, and we might translate: “are in a certain condition.” Manetti comments that corruption from τινᾶ into ἤδη is paleographically easy (TINA into HΔH) and that the occurrence of ἤδη only five words later may have prompted the change. She may well be correct, and I have recorded her suggestion in the *apparatus criticus*. I prefer, however, to keep the reading of codex A, for τινᾶ adds little, and in any case, Theophrastus may have written ἤδη (“already”), because he was thinking of men, adolescents or older, who have been sexually active and as a result are already in a bad condition. See the note on 8.47–9.

6.40 καὶ . . . δὲ] cf. 5.30–1 and 21.143.

7.41 ἄτοπον δ’ ἂν δόξειε τοῦτο εἶναι καὶ ἐναντίωσίν τιν’ ἔχον] Cf. 21.141 ἄτοπον δ’ ἂν ἐκείνο δόξειε καὶ ὥσπερ ὑπεναντίον. For ἄτοπον, see also 21.144 and 36.226.

7.44 οἱ γέροντες] Aged men are discussed again in section 19.

7.44, 46 οὐδαμῶς . . . παντελῶς] The first of these adverbs, οὐδαμῶς, involves overstatement; it is not true that aged men *never* smell badly when they sweat. The second, παντελῶς, may seem an exaggeration, but if growth (7.45) is taken to mean increase in height, then there is no overstatement. In any case, such imprecision at 7.44 should not trouble us (Theophrastus moves from less to none, from a comparative to a limiting case), and it is certainly not grounds for emendation; cf. 30.193–4.

7.44 ἄλλ’ ἢ βαρύτης τοῦ χρώματος] The lemma is the reading of codex A. Corruption is certain; what should be read is not. Possibly χρωτός or some other form of χρώς (“skin”) has been corrupted to χρώματος. We may compare *Problems* 4.12 877b21–2, where we are told that the skin of adolescents smells (οἱ χρώτες ὀξουσιν).⁷⁹ Two more likely emendations are περιττώματος and σώματος. The former seems especially suitable in view of the immediately following remark: “and yet the age of adolescents is most capable of concoction.” Nevertheless, the latter is an easier correction (two letters are replaced by one) and not at all incompatible with what precedes and follows. First Theophrastus recognizes oddity in the fact that adolescents are especially malodorous when they sweat (7.41–4). Then he

⁷⁹The skin of children (ὁ χρώς τῶν παίδων) and of young children (ὁ τῶν παιδίων) is mentioned at 18.123–4.

develops the oddity. He tells us that the heavy smell of adolescents belongs to—is attributable to—the body (the lemma, reading σώματος for χρώματος) and adds that adolescents are most capable of a relevant bodily process, i.e., concoction (7.45). The question becomes how adolescents can have bodies which are both most capable of concoction and yet secrete sweat which is most offensive.

The noun βαρύτης does not occur elsewhere in *On Sweat*, but the cognate adjective, βαρύς, occurs twice and in different senses. At 11.75, Theophrastus speaks of sweat which is heavier coming from deeper within (ὁ δ' ἐκ βάθους μᾶλλον βαρύτερος). Here the comparison is with watery and thin sweat (ὕδατώδης and λεπτός 11.75) so that βαρύτερος almost certainly refers to greater density and weight. In contrast, at 6.37–8 Theophrastus speaks of men who take exercise and seem to be in good condition, but have a heavy and bad odor when they sweat (βαρεῖς καὶ κακῶδεις τοῖς ἰδρῶσιν). Here it is oppressive odor to which the adjective refers, and it is this usage which is especially relevant to βαρύτης at 7.44, for it comes within the same discussion of malodorous sweat. I suggest, then, reading σώματος for χρώματος and translating 7.44–5 as follows: “But the heaviness (of the odor of young people) belongs to the body, and yet the age of adolescents is most capable of concoction.”⁸⁰

7.45 πεπτικωτάτη ἡ ἡλικία τῶν ἐν ἡβῃ · σημεῖον δὲ τὸ τῆς αὐξήσεως] Concoction is required for growth; cf. 19.125, where we are told that the heat of young children concocts for the sake of growth.

8.47–9 αἴτιον δ' ὅτι πρὸς τὰ ἀφροδίσια μάλιστ' ἐν ὁρμῇ τῶν ἐν ἡβῃ, καὶ τῶν πόρων ἄνοιξις καὶ μεταβολή, πάντα δὲ ταῦτα συνεργὰ πρὸς κακωδίαν] In his notes, Schneider proposed supplying either τὰ σώματα after τῶν ἐν ἡβῃ or reading οἱ ἐν ἡβῃ. Wimmer actually printed the latter and translated *adolescentes*.⁸¹ There is, however, no strong reason to supplement or emend the text, for we can easily understand ἡ ἡλικία, which occurs in 7.45 and then is understood twice (ἡ without ἡλικία occurs once) at the end of section 7: ἡ δὲ τῶν πρεσβυτέρων . . . τῶν δ' ἡδὴ γερόντων.⁸² On other unnecessary supplements, see below on 19.128–9, 130–1, 20.134, 23.159–60 and 25.170–1.

⁸⁰ For the noun, βαρύτης, referring to heavy smell, see *Problems* 2.13 867b9—ἐν τῇ ὁσμῇ βαρύτης—where the author is discussing why rue makes sweat smell badly (which is also the subject in *On Sweat* at 5.33–5 and 10.61–2).

⁸¹ Grangerius and Furlanus translate *puberes*, but they do not alter the Greek text.

⁸² I am following a helpful suggestion by Antonio Battezzore.

To explain the malodorous sweat of adolescents, Theophrastus mentions three things: sex drive, open pores and bodily change.⁸³ The first, sex drive or being ἐν ὁρμῇ, may be either dispositional or occurrent. I.e., Theophrastus may be calling attention to a propensity characteristic of adolescents, or he may be taking note of occurrent desire which results in ejaculation. In regard to adolescents, the distinction may be largely theoretical, for it is natural that adolescents ejaculate frequently: nocturnal emission as well as masturbation and intercourse. See the note on 6.39–40.⁸⁴

The second and third things mentioned by Theophrastus, open pores and bodily change, are likely to refer to the results of actual sexual activity. We may compare *Problems* 4.12, where the author tells us that ejaculation is followed by relaxation of the body, cooling, reduced concoction and open pores. The result is said to be salty and bad smelling sweat (877b32–6). The mention of open pores has an obvious connection with the Theophrastean passage (ἀναστομουμένων τῶν πόρων *Problems* 877b34, τῶν πόρων ἄνοιξις *On Sweat* 8.48) and the reference to cooling (καταψύχονται *Problems* 877b33) may explain in part what Theophrastus has in mind when he speaks of change (μεταβολή 8.48).

8.49 ἡ δὲ τῶν πρεσβυτέρων * * * οἶά τις ἔξις] With the opening words of the lemma, ἡ δὲ τῶν πρεσβυτέρων, I understand ἡλικία. I do the same above with τῶν ἐν ἡβῇ (8.47) and below with ἡ δὲ τῶν γερόντων (8.50). It is possible that some other word occurred in the lacuna,⁸⁵ but whatever Theophrastus wrote, the sense is not in doubt.

After the lacuna, codex A has οἶά τις ἔξις. The form οἶά is neuter plural used adverbally; cf. 10.66 (also a disturbed passage), and see LSJ s.v. οἶος V.

⁸³ Although μεταβολή (8.48) is not qualified by, e.g., σωματική, it is clear that the change in question is bodily. Contrast 3.20, where μεταβολή is explicitly qualified by τῆς τροφῆς.

⁸⁴ In *Problems* 4.12, which is fuller but closely related to *On Sweat* 8.47–9, the author begins by speaking of the time when adolescents first acquire the capacity to be sexually active: ὅταν ἄρξωνται ἀφροδισιάζειν δύνασθαι (877b21). That suggests a capacity or disposition, which may or may not manifest itself in occurrent desire and ejaculation. Later, however, the author focuses on ejaculation and its consequences within the body (877b32–6). See the next paragraph; also Hopfner p. 239.

⁸⁵ One may be tempted to understand or to supply ἔξις, but the occurrence of ἔξις in the immediately following ὥς-clause seems to tell against the idea.

8.50–3 ἡ δὲ τῶν γερόντων διὰ μανότητα καὶ εὖπνους· διὸ καὶ οὔτε περιττωματικὴ· ἅμα δὲ καὶ εὖπνουν (ἔχουσι τὸ σῶμα καὶ) ἀπερίττωντον, καὶ οὐδ(ὲν ἐκκρίν)εται τοιοῦτον ἀφ' οὗ γίνονται ἂν τὸ κακῶδες] These lines are repetitive: breathing well and lack of residue are both mentioned twice. That may be undesirable in a polished work, but *On Sweat* is not such a treatise; cf. the note on 25.171–2.

With the opening words, ἡ δὲ τῶν γερόντων, I understand ἡλικία. See above on 8.47–9 and 8.49.

Instead of εὖπνους at 8.50, the Aldine edition has εὖπνοιαν. If we adopt that reading, the preposition διὰ has two objects: “on account of rarity and good breathing.” The sentence is then incomplete, so that we might choose to follow Schneider and to indicate a lacuna. But whatever Theophrastus actually wrote, the sense is clear. The skin of aged men is rare or less dense; it breathes well, so that no residue is produced and nothing is secreted which might be malodorous (8.50–3).

In line 8.50, the word μανότης, which I have translated “rarity,” refers to looseness or openness in the texture of the skin. We may compare 19.128, where Theophrastus tells us that aged men are characterized by rarity of skin: they are μανόχροοι. In 19.129, rarity and ease of breathing are conjoined as they are in 8.50. The opposite of μανότης is πυκνότης, “density” (cf. *Research on Plants* 1.5.4). In regard to skin, this condition is exhibited by children. At 18.123, their skin is said to be dense: πυκνὸς ὁ χρώς; that of young children is described as very dense: πυκνότατος. The pores of the skin are as it were closed, so that children have difficulty sweating (18.120–4). In contrast, the bodies of well trained adults are rare in texture, have open pores and sweat easily (21.141–5).

9.54–5 δηλοῖ δ' ἡ [διὰ] τῶν τριχῶν ἔκφυσις * * * τὴν μανότητα] The same idea is expressed in similar words at 33.208–10: ὑγρότης δὲ καὶ μανότητος ἄλλα τε πολλὰ σημεῖα καὶ ὁ ἐγκέφαλος καὶ ἡ τριχῶν ἔκφυσις, ὁ μὲν τὸ ὑγρὸν αἰ δὲ τὸ μανὸν ἀποδηλοῦσαι.

The text at 9.54–5 presents two difficulties. First, the preposition διὰ lacks an object: either διὰ must be deleted or an object supplied. Second, codex A exhibits a lacuna before τὴν μανότητα; a word referring to the head, e.g. τὰ ὕψη, may have dropped out, but given the elliptical nature of the treatise, omission seems in character. Moreover, the immediately preceding sentence ends with ἡ κεφαλὴ (9.54); that makes it easy to understand that τὴν μανότητα refers to the rarity of the skin or flesh which covers the head. Cf. the parallel passage in the *Problems* 2.6 867a6: δηλοῖ δὲ

μανὸς ὢν τῇ τῶν τριχῶν ἐκφύσει. Here, too, the immediately preceding sentence ends with a reference to the head, ὁ τῆς κεφαλῆς τόπος (a5), so that the phrase μανὸς ὢν needs no qualification in order to be understood.

9.55–8 δυσώδης δὲ τόπος καὶ τὰ ἐν αὐτῷ, ᾧ ἂν μὴ εὖπνοια· σήπεται γάρ, ἡ δὲ κακωδία σῆψίς τις. διὸ ὁ ἐκ τῶν μασχαλῶν ἰδρῶς καὶ ὅλως ὁ ἐκ τῶν κοίλων κακωδέστατος] On the connection between rot and bad odor, see the Theophrastean treatise *On Odors* 2–3.

There are two places in the *Problems* where the author mentions the bad odor of sweat secreted in the armpits. In the first passage, 4.12 877b36–9, mention comes after discussion of the malodorous sweat of adolescents. That reflects the order of topics in *On Sweat* 8–9. See the Introduction, Section 3. In *Problems* 13.8 908b20–3, the malodorous sweat of the armpits is discussed as a separate topic. As in *On Sweat*, there is reference to lack of ventilation and rot (908b21–2 picking up 9.56–7), but there is also reference to lack of motion and exercise (908b23), neither of which is mentioned in *On Sweat* 9.

Problems 2.14 867b19–21 is not a proper parallel to the Theophrastean passage, but it is concerned with sweat under the arms: the armpits are said to sweat most quickly and copiously, because they receive the least cooling.

9.58 ἡ κατάπνιξις] Here κατάπνιξις, smothering, is said to produce bad odor. At 39.243 it is said to cause lack of color.

10.61–2 τὴν δὲ διὰ τὸ πήγανον κακωδίαν καὶ ὑπὸ μύρων ἐνίων, ὅταν ἀναδιδῶσι, καὶ γὰρ τοῦτο συμβαίνει, λεκτέον· ὑπὲρ ὧν * * *] There are two textual problems here. The first concerns ἀναδιδῶσι, which is the reading of codex A. The likely meaning is “give off” an odor. See LSJ s.v. ἀναδίδωμι II.3, citing Plutarch, *Table Talk* 3.1 645E καίτοι τό γε μύρον τοῦτο . . . ἀναδίδωσιν εὐωδίαν. Nevertheless, Schneider, vol. 4 p. 783, changes the verb form to ἀναδοθῶσι. In that case, the phrase ὅταν ἀναδοθῶσι would mean “when they (rue and certain myrrh oils) are digested.” For ἀναδίδοσθαι in the sense of “to be digested,” see LSJ s.v. ἀναδίδωμι III.2. The emendation is attractive, for already at 5.33–5 Theophrastus has spoken of certain foods which produce a bad odor, and named rue. Now at 10.61–2, Theophrastus returns to the topic and mentions rue along with certain myrrh oils.

The second textual problem concerns the last three words of the lemma. With λεκτέον one might expect a preposition like περί or ὑπέρ plus the genitive.⁸⁶ Codex A has λεκτέον ὑπὲρ ὧν followed by a colon (or raised dot). In his edition of *On Sweat*, Grangerius prints a period after ὑπὲρ ὧν. Furlanus prints a colon in his edition and a period at the head of his note on page 245. Whatever the choice of punctuation, taking λεκτέον ὑπὲρ ὧν as a unit may well be correct.⁸⁷ Be that as it may, the immediately following words, γίνεται δὲ . . . , occur awkwardly, so that I have followed Schneider and marked a lacuna in the text.

In the *Problems*, there are two parallel passages, 2.13 867b8–11 and 20.33 926b16–19, which are almost identical in wording. The only interesting difference is that the second passage mentions not only heaviness in smell but also pungency, βαρύτης and δριμύτης (926b17–18). As in *On Sweat* 10.61–2, neither parallel passage contains an explicit reference to ingesting rue and myrrh oils. Unlike *On Sweat* (i.e., as it has been transmitted in codex A), each gives an explanation: when things having a heavy and pungent odor are mixed with liquid residue, they produce a worse smell.

There are two other passages in the *Problems*, where the author discusses the unpleasant smell produced by myrrh oil in combination with sweat. One of the passages, 13.9 908b24–8, is concerned with myrrh oil as an ointment applied externally. The other, 13.11 908b34–909a7, concerns *inter alia* types of myrrh oil which are taken internally and become foul smelling when secreted along with sweat (συνεξιδρώσαι 908b34).

10.63 γίνεται δὲ καὶ ὁ μὲν θερμός, ὁ δὲ ψυχρὸς ιδρώς] We may compare the Hippocratic treatise *On Diseases* 1.25, where hot and cold sweat are distinguished. The former is said to be secreted from bad matter, which has been thoroughly heated and thinned and is not large in quantity. In contrast, the former is said to be secreted from bad matter, which is larger in quantity. What is left behind is neither thinned nor burnt up, and what passes out is colder, thicker and characterized by bad odor. Closely related and perhaps based on the the Hippocratic text are *Problems* 2.35 and the second half of 31.23.⁸⁸ However, neither of the passages in the *Problems* mentions bad odor.

⁸⁶ Cf. the Theophrastean excerpt preserved by Simplicius in his *Commentary on Aristotle's Physics* 1.1 184a16–b14 (CAG vol. 9 p. 20.20) = 143.4 FHS&G.

⁸⁷ The use of ὑπέρ instead of περί appears to be motivated by a desire to avoid hiatus without introducing elision. See Einarson p. xliii–vi.

⁸⁸ Flashar p. 434.

10.65–7 αὕτη μὲν γὰρ ἔοικε κακεργασία τινὶ καὶ μεταβολῇ
 † οἷά τις ὑγρότης †· ἐκεῖνο δὲ μεταβολῇ μὲν τινὶ καὶ
 ἀλλοιώσει, οὐ φυσικῇ δὲ οὐδὲ κατακεκρατημένη] The text is
 difficult and editors have suggested several emendations on the assump-
 tion that two kinds of failed concoction are being discussed. It is certainly
 correct that two kinds are recognized in what immediately precedes,
 10.63–5: one kind results in cold sweat and the other in bad odor. It is not,
 however, certain that the subsequent lines, 10.65–7, develop this distinc-
 tion. For the lines can be understood as a comment concerned only with
 that lack of concoction which results in bad odor.⁸⁹ There will then be no
 need to change κακεργασία to κατεργασία, and the mention of unnatural
 and uncontrolled change and alteration can be understood as a further char-
 acterization of κακεργασία. In addition, there will be no compelling rea-
 son to emend the pronoun ἐκεῖνο to read ἐκείνη, though one still wants to
 know to what ἐκεῖνο refers.

I have placed *crucēs* around οἷά τις ὑγρότης. It is possible that a lacuna
 should be indicated before οἷά τις ὑγρότης, and that ἐκεῖνο refers to some-
 thing which has been lost.⁹⁰ Reading τῆς ὑγρότητος for οἷά τις ὑγρότης
 creates a tie to the preceding words κακεργασία τινὶ καὶ μεταβολῇ and
 eliminates any serious possibility of a lacuna. That may speak for reading
 τῆς ὑγρότητος,⁹¹ but it also encourages further emendation: namely read-
 ing ἐκείνη where the codex has ἐκεῖνο. “Totus hic locus laborat adhuc
 multis vitiis et obscuritate verborum.”⁹²

10.67–8 καθάπερ οὐδὲ τὰ τῆς κοιλίας περιττώματα
 δυσώδη] The connection of these words with what precedes is problem-
 atic, partly because the preceding lines are so uncertain. Wimmer marked a
 lacuna in the text and I have followed him. If there is no lacuna, then the
 words in question seem intended to elucidate the case of cold sweat lack-
 ing bad odor: one odorless residue is compared with another.

At 5.32 the word κοιλία is used of the stomach, and at 9.59 it is used
 quite generally of bodily cavities. Here at 10.68 it seems to refer to the
 intestine(s), as it does later at 19.126 and 20.133, 135.

⁸⁹ I say only “can” and do not wish to imply greater probability.

⁹⁰ Cf. 8.49, where a lacuna (present in codex A) precedes the words οἷά τις ἔξις ἤδη καὶ μένουσα.

⁹¹ The emendation is suggested by Schneider vol. 4 p. 784 and actually printed by Wimmer in both his editions.

⁹² Schneider vol. 4 p. 784, whose interesting note presents possibilities without remov-
 ing doubts concerning the actual words of Theophrastus.

According to *Problems* 13.1 907b21–6, the longer dung, κόπρος, remains in the body (i.e., in the intestines) the less bad odor it has. The reason given is that dung within the body becomes drier over time and what is dry is less rotten. That may relate to the Theophrastean words under consideration (especially if context is lost through a lacuna), but in *Problems* 13.1, the comparison (contrast) is not with sweat. It is with urine which acquires a worse odor the longer it remains in the body (i.e., in the bladder).

11.69 Διότιμος . . . ὁ γυμναστής] Diotimus the trainer is known only from this passage.

11.69–70 ὅτι τρεῖς τινὲς διαφοραὶ τῶν ἰδρώτων εἰσὶν ἀρχομένων τε καὶ μεσοῦντων καὶ ληγόντων] The three varieties distinguished by Diotimus are three stages in a single episode. Presumably Diotimus observed that his trainees regularly secreted qualitatively different kinds of sweat at the beginning of a workout, in the middle and at the end. That he explained the difference in terms of bodily change is not to be doubted, but in our text what follows (11.71–6) is Theophrastus' comment on the three varieties.⁹³ In other words, Diotimus' observation functions as a problem, for which Theophrastus offers an explanation.

11.75 ὁ δ' ἐκ βάθους μᾶλλον βαρύτερος] The idea that sweat coming from deeper within is heavier may be compared with 4.24: εἰ δὲ πορρωτέρωθεν ἀλυκώτερος, “if (sweat is drawn) from a greater distance, it is saltier.” In both passages, the intensification of a quality is connected with a more remote source.

Here the adjective βαρύς is used with reference to weight. At 6.38 it is used of oppressive odor. At 7.44 the noun βαρύτης occurs, but the passage is corrupt. See the note *ad loc.*

11.76 συντηκομένης τῆς σαρκός] On sweat resulting from colliquescence of flesh, cf. 30.194–5. The idea is found in the Hippocratic treatise *On Regimen* 2.66. See Debru (1996) p. 188.

12.76–7 ἤδη δὲ τινὲς φασι καὶ αἵματι εἰκάσθαι, καθάπερ Μονᾶς ἔλεγεν ὁ ἰατρός] As is true of Diotimus the trainer (11.69), so Monas the doctor is not known from elsewhere. He and other unnamed

⁹³ μὲν οὖν at 11.71 is transitional and prospective (see Denniston, s.v. no. 2, p. 473–5); it looks forward to Theophrastus' own comment.

persons are cited in regard to sweat which has the appearance of blood. The explanation which follows (beginning with δῆλον, line 77) is that of Theophrastus. See the note on 11.69–70: citing Diotimus serves to introduce a problem, which is then addressed by Theophrastus.

12.77–80 δῆλον ὥς ἐπισπασθείσης πλείονος ὑγρότητος ἐκ τῶν φλέβων , ἀπέπτου δέ, ὥσπερ ἀνακεχρωσμένης ταύτης· ἐνίστε γὰρ καὶ αὐτὸ τὸ αἷμα γίνεται ἄπεπτον.] On ὥς (second word) plus a genitive absolute, see LSJ s.v. ὥς C.I.3.

When sweat has the appearance of blood, there has been a failure of concoction. Debru, “La sueur des corps,” p. 168 n. 23 compares Aristotle, *On the Parts of Animals* 3.5 668b1–15. Here Aristotle first tells us that (blood) vessels get progressively smaller until they are too small for blood to pass through. However, the liquid residue, which is called sweat, can pass through, especially when the body is thoroughly heated and the mouths of the small vessels are open. After that, Aristotle says that in some men sweat consists of a bloody residue which is caused by a bad condition of the body. Too little heat in the small blood vessels results in lack of concoction, which in turn results in watery blood. Lacking thickness it passes out as bloody sweat. Theophrastus’ remarks are much briefer, but he may well be thinking along the same or similar lines. He makes explicit reference to the (blood) vessels from which moisture is drawn, characterizes the moisture as unconcocted, and says that sometimes blood occurs unconcocted. If we ask why Theophrastus speaks of “more” moisture being drawn from the vessels, the answer may be that he is thinking of adding the colored moisture of unconcocted blood to that liquid residue which is thinner than blood, passes through small vessels and appears on the surface of the skin as clear sweat.

For modern explanations of colored sweat, see above, A Preliminary Note on Modern Accounts of Sweat.

12.80 ἀπλῶς δὲ τοῦτό γε ὥσπερ πολλάκις εἴρηται . . . ὅτι κατὰ τὰς ἔξεις τῶν σωμάτων ἢ ἔκκρισις] The pronoun τοῦτο is forward looking; it is answered by the ὅτι-clause. Cf. 7.41–2, where the same combination occurs; see also 23.158–9 and the note *ad loc*.

Theophrastus adds ὥσπερ πολλάκις εἴρηται, “as has been stated often,” because in the preceding discussion of bad odor he has repeatedly recognized that the condition of the body determines the odor of sweat. (esp. 5.32–3, 6.36–7, 38–40). He may also have in mind the statement ear-

lier in the present discussion: namely that varieties of sweat occur through the intensification of exertion and the alteration of the body (11.71–2).

12.82 ἀεὶ] The translation “always” seems natural in this context, but the meaning is “on each occasion,” i.e., whenever secretion occurs. Cf. 15.101, 22.152; and see Passow-Crönert s.v. ἀεὶ 4.

13.83 ἔλκη ἔχουσιν] The lemma is the reading of codex A. Forster’s proposed emendation, ἔλκη ἐκφύουσιν, is based on *Problems* 5.27 883b26.⁹⁴ As stated in the Introduction, Section 3, it is a case of unnecessary enhancement.⁹⁵

13.83–6 διὰ γὰρ τὴν ἀκαθαρσίαν τοῦ σώματος ἡ κίνησις προσοῦσα καὶ θερμαίνουσα συνεξικμάζει τὰ περιττώματα μετὰ τοῦ ἰδρώτος, εἴπερ εὖ· ὅτε δὲ] The final words of the lemma, εἴπερ εὖ· ὅτε δὲ, are unduly condensed, but there is no compelling reason to emend. Theophrastus takes note of two cases. In the first, unwanted residue is successfully removed together with sweat. That is indicated by the short phrase εἴπερ εὖ, “if [it goes] well.” Next, Theophrastus mentions the case in which unwanted residue is not removed along with sweat. ὅτε is used adverbially. See LSJ s.v. ὅτε C. The phrase ὅτε δὲ is often used in a correlative construction: e.g., at 15.104 μάλιστα μὲν . . . ὅτε δὲ. But the phrase also occurs alone: cf. Xenophon, *On Hunting* 5.8 and 20, 9.8 and 20.

Theophrastus tells us that sweating removes impurities from the body, if the process goes well. There is no single passage in which Theophrastus states explicitly that the function of sweating is cleansing, but this passage, together with 2.7–10, 20.135–40 and 30.194–6, suggests that he might have done so. He might also have noted that sweating can relieve certain cases of fatigue by removing the fluids which cause the condition. Again the idea is not stated explicitly in *On Sweat*,⁹⁶ but we may compare the treatise *On Fatigue*. Excessive fluid is recognized as a cause of fatigue (1–

⁹⁴ Forster, *Some Emendations*, p. 168. LSJ s.v. ἐκφύω III first cites Hippocrates, *Epidemics* 6.5.15 for the phrase ἔλκεα ἐκφύουσιν and then compares *Problems* 883b26. The recent editions of *Epidemics* 6 by D. Manetti and A. Roselli (Biblioteca di Studi Superiori 66, 1982) and by W. Smith (Loeb 1994) have ἔλκεα ἐκθύουσιν. See the note of Manetti and Roselli p. 121 on 15.11.

⁹⁵ *Problems* 5.27 exhibits a further change. Whereas *On Sweat* 13.83 reads ἐνίοι, *Problems* 5.27 has ἐνίοις. That means ἐκφύουσιν is intransitive in *Problems* 5.27 (LSJ III). Forster does not mention changing ἐνίοι to ἐνίοις at *On Sweat* 13.86.

⁹⁶ Neither the word κόπος nor a cognate word is found in *On Sweat*.

6);⁹⁷ and the secretion of fluid through the skin is mentioned as a way to achieve relief (6). The secretion in question is sweat.⁹⁸ For a Hippocratic text which offers similar ideas, see *On Regimen* 2.66.⁹⁹

Finally, it should be stated clearly that Theophrastus did not understand what modern medicine teaches us: namely, that in human beings sweating has a cooling function.¹⁰⁰ Aristotle had assigned that function to breathing, and Theophrastus appears to have followed his teacher.¹⁰¹ See *On Fish* 1.1–3 and 3.34–5 (RUSCH vol. 5 [1992] p. 360 and 362 Sharples).¹⁰²

13.86 χυμῶς] The lemma is the reading of codex A. It also occurs in *Problems* 5.27 883b29. I have, therefore, chosen not to follow Schneider, who emends the text to read χυλοῦς. The same can be said in regard to χυμοῦ at 13.89 (*Problems* 5.27 883b32 has χυμοῦ) and 14.91. However, χύλου is found in A at 15.101, and χυλῶν at 16.112. In the first of these

⁹⁷ Theophrastus also considers the possibility that men may experience fatigue when their bodies are dry (*On Fatigue* 5). Cf. the third group of men discussed in the Hippocratic treatise *On Regimen* 2.66, summarized below in note 99.

⁹⁸ Although neither ἰδρῶς nor a cognate word occurs in *On Fatigue* 6 (or anywhere else in the treatise), it is clear that sweating is considered useful for persons whose fatigue is caused by colliquescence. We should compare the words πλείοσι τόποις ἔκκρισιν ἐποίησε τοῦ λυποῦντος καὶ κατὰ σάρκα καὶ κατὰ κύστιν with *On Sweat* 2.9–10: τὸ γὰρ τοιοῦτον ἐν μὲν τῇ ὑποστάσει τῇ κατὰ τὴν κύστιν οὔρον, ἐν δὲ τῇ σαρκὶ ἰδρῶς καλεῖται. In both passages Theophrastus takes account of the fact that urination and sweating are ways in which fluid is removed from the body.

⁹⁹ In *On Regimen* 2.66, fatigue is discussed in relation to three groups of men. The first is composed of men who are not in training and yet exert themselves. Their flesh is moist, so that exertion causes colliquescence. As a consequence, fluids need to be removed, and toward that end sweating is useful. Second, there are men who are in training but engage in exercises to which they are not accustomed. Here there is no explicit reference to sweat (i.e., neither ἰδρῶς nor a cognate word occurs), but it seems clear that sweating can relieve fatigue, since the condition is caused by colliquescence in parts of the body which have not been regularly exercised and which are marked by moist flesh. The third group is made up of men who overdo an exercise to which they are accustomed. There is no suggestion that sweating can cure the fatigue of these men, for their condition is one of dryness. For some discussion, see Roselli, “Theophrastus’ Περὶ κόπων,” p. 129–30.

¹⁰⁰ Modern physiologists reject the idea that sweating plays an important role in the removal of waste products. See above: A Preliminary Note on Modern Accounts of Sweat.

¹⁰¹ See Aristotle, *On Respiration* 4 472b1–5, 10 475b15–19, 476a7–8, 11 476b4–5, 15 478a21–5, 16 478a28–31, 19 479b8–13 and *On the Parts of Animals* 3.6 668b33–669a14. For commentary, see Longrigg p. 216–17, 220–2, who points out that Diocles of Carystus, a physician and contemporary of Theophrastus, likewise assigned a cooling function to breathing (fr. 15 Wellmann).

¹⁰² In the second passage, Theophrastus adds the qualifier “or whatever it is that results from breathing” (3.35), but the addition may be more stylistic than doctrinal. See Sharples p. 85–6, 106.

two passages, the reference is to the juices of human beings. In the second, it is to the juices of plants.¹⁰³

13.88 διὰ τὸ πλῆθος] The lemma is the reading of codex A. Schneider, following Grangerius, emends to διὰ τὸ πάχος. The emendation is suggested by διὰ πάχος in *Problems* 5.27 883b30–1, but διὰ πλῆθος recurs in *On Sweat* at 15.100–1, where quantity of residue is cited as a cause of eruption.

14.89–91 τὸ περὶ τὴν ψώραν καὶ τοὺς λειχήνας καὶ λέπραν καὶ ὅλως ὅσα ἐκφύματα γίνεται] The list of eruptions is representative, as the final words of the lemma, “and generally all the eruptions which occur,” make clear. The translations “scab,” “scurvy” and “leprosy,” are conventional and not scientific. Elsewhere, Theophrastus uses the term ψώρα, when speaking of a skin disease which afflicts cattle (*Research on Plants* 9.9.4). He also uses the term in regard to the fig tree (*Research* 4.14.3, 5); he speaks of fermentation resulting in efflorescence (*Plant Explanations* 5.9.12). The verb cognate with λειχήν, i.e., λειχνηῖαν, occurs with reference to fig trees which suffer from excessive moisture (*Explanations* 5.9.10). The term λέπρα is used in describing the appearance of the squalid man (*Characters* 19.2), and the plant known as the dark chamaeleon is said to be a remedy for the disease (*Research* 9.12.2).

14.92–4 † ὧν σπειρῶνται καὶ δεῖν κατ’ ἄλλον τρόπον † ἀντισπῶντας καὶ ἀντικαθιστάντας παῦλάν τινα ποιεῖν] The lemma is the text of codex A. There is corruption at the beginning as indicated by the *crucēs*. In the Aldine edition as well as that of Grangerius, Furlanus and Schneider, the opening words are ὧν πειρῶνται καὶ δὴ κατ’ ἄλλον τρόπον. They make good sense,¹⁰⁴ except that the phrase κατ’

¹⁰³ See Forster, *Further Emendations*, p. 141, who says that “χυλός appears never to be used of animal humors,” and Sharples, p. 194 on text 419 FHS&G.

¹⁰⁴ While changing ὧν σπειρῶνται to ὧν πειρῶνται is attractive, there is room for doubt. Glenn Most has suggested to me that Theophrastus may have written ὧν τείρονται: “of those who suffer (from these maladies).” The verb τείρειν is primarily poetic, but it is occasionally found in prose. See LSJ s.v. τείρω, citing Galen *On Prognosticating* 14.632.9 K and Aelian, *On the Nature of Animals* 14.11. A different possibility is suggested by the fact that Theophrastus uses the noun σπείρα to refer to curl or coiling in the grain of wood (*Research on Plants* 5.2.3). It seems, therefore, possible, though unlikely, that the verb σπειρᾶσθαι was used at *On Sweat* 14.92 to describe a skin disease which resembles coiling.

ἄλλον τρόπον seems to imply that a method for removing eruption has already been mentioned.¹⁰⁵ Since none has been mentioned, it is tempting to follow Wimmer, who changes τρόπον to τόπον, “way” to “place.” That would fit the subsequent reference to revulsion, but there is no certainty here.¹⁰⁶ Given that corruption begins already with ὧν σπειρῶνται and that lecture notes may leave things unsaid, I have thought it best to print the text of A, to place *cruces* in the text, and to offer an alternative text and translation in a note to the translation.

The participle ἀντισπῶντας, translated by “causing diversion,” refers to revulsion: i.e., diverting downward the residue which has risen to the surface. Cf. the Hippocratic treatise *On Humors* 1: ἀντίσπασις, ἐπὶ τοῖσιν ἄνω, κάτω, ἄνω, ἐπὶ τοῖσι κάτω, “revulsion, downwards when there is an upwards tendency, upwards when there is a downward tendency” (trans. Jones, Loeb edition).

14.95 * * * καθ’ αὐτὰ χρῆ θεωρεῖν] Codex A has a lacuna of c. twelve letters before καθ’ αὐτὰ. Grangerius supplies αὐτὰ, which gives a readable text, but the supplement is shorter than the lacuna. Codex R exhibits no lacuna. So, too, the editions of Schneider and Wimmer. As often, one wonders whether the lacuna, especially its length, is a reliable indication of what has been lost.

Codex A has no punctuation between the preceding διαφέροντα and the lacuna. Codex D exhibits a comma at this point. Codex R, which has no lacuna, exhibits a comma after διαφέροντα and before καθ’ αὐτὰ. The same is true of Schneider’s edition. Be that as it may, καθ’ αὐτὰ is to be taken with θεωρεῖν.

On χρῆ θεωρεῖν, see above on 1.6.

15.96 ἡ τῶν τοιούτων ἔκκρισις] In combination with ἔκκρισις, the words τῶν τοιούτων almost certainly refer to residues (περιττώματα 13.85–7 and 14.92) and not to eruptions (ἐκφύματα 14.91).

15.97–8 οὐ γὰρ ὅτι ταῦτα πόνου προσδεῖται καὶ τῆς ἔξωθεν κινήσεως, ἀλλὰ τὰ δι’ αὐτῶν διωθεῖται ὑπὸ τῶν κρατούντων] We should take οὐ . . . ὅτι closely with ἀλλὰ and translate

¹⁰⁵ The phrase itself (in another context) is unobjectionable; it recurs at 19.131–2.

¹⁰⁶ Instead of replacing καὶ δεῖν with καὶ δὴ, Wimmer prints καθάρσει. For two reasons, I much prefer καὶ δὴ: first, it is closer to the text of codex A; second, the subsequent mention of revulsion makes a reference to cleansing unnecessary.

“not only . . . but.” See. LSJ s.v. ὅτι V and Kühner-Gerth vol. 2 p. 257–8, to which Bob Sharples and Herwig Görgemanns have called my attention. Theophrastus is saying that the secretion of residue occurs not only through exertion and external motion, but also apart from stress. I.e., eruptions may arise διὰ κακεξίαν τινά, on account of a bad condition of body (15.95–6); residue may be driven through the skin ὑπὸ τῶν κρατούντων, by dominant elements within (15.98). An example, pimples, is mentioned in the next sentence. See the note on 15.99.

Theophrastus writes προσδεῖται, and not δεῖται, because he thinks of exertion and external motion as additional and secondary. The fundamental cause of eruption is a bad condition of the body. He concluded the preceding discussion of different varieties of sweat by stating generally that “the secretion of residues is always in accordance with the (different) states of body” (12.81–2); he began the present discussion by applying the principle to ulcers (διὰ τοῦτο, “on account of this” 13.83). They are caused by the impurity of the body (13.83–4). Motion is a factor, but one which is additional (προσοῦσα 13.84). Similarly, when Theophrastus writes προσδεῖται, he is making clear that exertion and external motion are additional factors. They are needed only in some cases (ἐνίοις 15.102), some of the time (ἐνίοτε 17.116).

How one understands the reference to dominant elements, ὑπὸ τῶν κρατούντων, depends on how one emends the immediately preceding words. Codex A has ἀλλὰ τὰ δι’ αὐτῶν διωθεῖται, in which the phrase τὰ δι’ αὐτῶν is almost certainly corrupt. I have followed codex R and printed αὐτῶν instead of αὐτῶν.¹⁰⁷ On this reading, the phrase is elliptical but intelligible. We may translate “the (residues which erupt) of themselves.” Theophrastus is saying that there are residues which reach the surface of the skin and erupt on their own.¹⁰⁸ Earlier he told us that the secretion of residues occurs in accordance with the condition of the body (12.81–2, 15.95–7). In addition, he took note of the fact that exertion and bodily motion (πονεῖν and τοῦ σώματος ἡ κίνησις) result in ulcers when the residues within the body are thick and contain bad juices (13.83–9). Now he wishes to make clear that eruptions of the skin may occur apart from exertion and bodily motion. To do that he adopts a “not only . . . but” construction, in which the second part is emphatic: “but the (residues which erupt)

¹⁰⁷ In codex R, a rough breathing has the appearance of a crescent moon on its back.

¹⁰⁸ Cf. LSJ s.v. διὰ A.III.a.

of themselves are driven through the skin by the dominant elements.”¹⁰⁹ If we emphasize the words “of themselves,” we may say that the dominant elements are restricted to portions of the residue: those which are thick as well as juices which are acidic, salty and bitter (13.86–7). That fits well with what has been said above in lines 88–9: “(the residues) rise up and cause the flesh to ulcerate on account of the bitterness of the juice.” It also fits well with what follows: see the note on 15:100 ποιεῖσθαι τὴν ἔκκρισιν. Nevertheless, I am not certain that such a narrow interpretation is necessary. The fundamental contrast is with exertion and bodily motion (13.83–4, 15.97–8)—what Theophrastus calls “external” motion (15.97)¹¹⁰—and that suggests a more inclusive interpretation: the dominant elements which drive residue through the skin are all within the body; they include not only the elements which compose the residue but also other (healthy) elements which play a role in the removal of residue.

A different approach to the textual difficulty was suggested by Schneider vol. 2 p. 611. The reading of codex A ἀλλὰ τὰ δι’ αὐτῶν is emended to read ἀλλὰ καὶ τιν’ αὐτῶν. That gives the text a good sense: “but also some of the (residues) are driven through (the skin) by the dominant elements.” It also encourages an inclusive interpretation of the dominant elements, for we are no longer told that the residues pass through the skin “of themselves” or on their own. That may appeal to common sense, but the emendation is more invasive than a simple change of accent, and it may be less well suited to what follows. Be that as it may, the text remains problematic. I have printed the simplest change and reported Schneider’s suggestion both in the *apparatus criticus* and in a note to the translation.

15.99 τὰ μὲν τῇ ὥρᾳ διακρινόμενα] In some cases the separation and secretion of residues is caused by “the prime of life,” i.e., adolescence, during which skin problems are common. Earlier scholars have construed ὥρα as “the time of year.” Cf. the translations of Furlanus and Wimmer: *alia ab anni tempore . . . excernuntur* (-antur Wimmer).

15.100 ποιεῖσθαι τὴν ἔκκρισιν] The infinitive is in the middle voice. The subject is “residues” (understood with τὰ μὲν . . . διακρινόμενα τὰ δ’, line 99) and the object is “secretion” (τὴν ἔκκρισιν). I have trans-

¹⁰⁹ Cf. Kühner-Gerth vol. 2 p. 258: “Das erste Glied mit οὐχ ὅτι u.s.w. drückt überall etwas Schwächeres, das zweite mit ἀλλὰ überall etwas Stärkeres (eine Steigerung) aus.”

¹¹⁰ Cf. the use of ἔξωθεν in *On Dizziness* 1. The motions which men experience as giddiness may originate in the body (alien breath and fluids from residue reach the brain) or they may originate “from without” when a man rotates his head.

lated “(residues) effect secretion.”¹¹¹ That is in line with 13.88: “(residues) rise up and cause the flesh to ulcerate” (ἐξαίρεται δὲ καὶ ἐξελκοῖ τὴν σάρκα), and with 15.89, following codex R. See the note on 15.97–8.

15.101 ἀεὶ] Here the meaning is “on each occasion.” See the notes on 12.82 and 22.152–4.

15.101 χυλοῦ] For consistency within the treatise, we may be tempted to emend the text here and read χυμοῦ. See the note on 13.86.

15.101–5 ὅτι δὲ κινήσεις καὶ οἱ πόνοι ποιοῦσιν ἐνίοις τὰ τοιαῦτα φανερόν καὶ ἐκ τῶν ἐνοδίων καλουμένων, ἃ γίνεται πολλοῖς ὅταν εἰς ὁδὸν ἐμπέσωσι, μάλιστα μὲν ἐπὶ τοὺς μηροὺς ὅτε δὲ καὶ ἐπὶ πλεῖον· ἔστι δ’ οἷς καὶ αἱ κνήμαι παραπίμπρυνται] Here Theophrastus refers to road sores, ἐνόδια, as clear evidence that in some men eruptions of the skin are caused by motions and exertions. The road sores mentioned here are not blisters on the feet caused by rubbing or friction, for eruptions of this kind are not closely tied to exertions, πόνοι, and barring an aggressive infection, they do not spread to the shins, κνήμαι. What, then, are the road sores referred to by Theophrastus? A firm answer is elusive, for the text is corrupt. In the phrase μάλιστα μὲν ἐπὶ τοὺς μηροὺς, the last word is a conjecture. Codex A has μει followed by a gap of four or five letters. Grangerius supplied μεῖον ὁδεύειν εἰωθότας, “those who are less accustomed to travel.” The supplement has not been adopted by subsequent editors. It is much too long for the gap in codex A (but does the gap accurately reflect what has been lost?), and the subsequent reference to shins, “shins too,” suggests that some other part of the body was mentioned in the lacuna.

Furlanus was the first to supply μηροὺς; Schneider and Wimmer have followed him. The supplement fits the gap in codex A and fits well with the subsequent reference to shins. On this reading road sores are eruptions which occur especially on the thigh, but can appear over a wider area including the shins. To understand why the thigh is especially subject to eruptions caused by travel on foot, it may be helpful to compare *On Fatigue* 10, where Theophrastus explains why men experience tiredness more in the thighs than in the calves. The explanation is bipartite: there is greater stress in the thighs than in the calves, and the thighs are nearer to

¹¹¹ See LSJ s.v. ποιέω A.II.2 med. “procure for oneself, gain” and 4 “make (on one’s own part, for oneself).”

the place containing residue. Similarly in regard to road sores, Theophrastus might want to say that the thigh, and not the calf, is especially subject to eruptions brought on by walking, for there is both greater stress in the thigh and more residue in the region of the thigh than in the calf.

I have printed Furlanus' supplement as generally convincing, but I want to underline that I have no knowledge of road sores of the kind described and therefore wonder whether Theophrastus may be thinking of swelling which occurs primarily in the ankle and may spread upward. In Latin, such a condition is called *flemina*. See Paulus, *Excerpts from Pompeius Festus*, s.v. p. 79.14–15 Lindsay: *flemina dicuntur, cum ex labore viae sanguis defluit circa talos*: "one speaks of *flemina*, when as a result of laborious travel blood flows down around the ankles." Furlanus himself (p. 248) cites Plautus, *Epidicus* 669–70, where Apocides complains: *dum te sequor, lassitudine invaserunt misero in genua flemina*: "while following you (Periphanes), through fatigue swelling has wretchedly invaded my knees." The Greek original of this play is unknown, but it has been dated to 292 or 289 B.C.¹¹² Theophrastus may have seen it, but we need not suppose that he was influenced by a line in the Greek original. It is enough to suppose that he was familiar with the condition called *flemina* in Latin (from the Greek φλεγμονή). For that permits us to ask whether μηροὺς is the correct supplement. Perhaps the lacuna is larger than that indicated in codex A, and perhaps a reference to ankles has been lost.¹¹³

15.104 μάλιστα μὲν . . . ὅτε δὲ] See the first note on 13.86.

16.108 ὅπερ καὶ πρὸς τὰ ἐξαιρόμενα συμβαίνει] It is not immediately clear what phenomena are being referred to by τὰ ἐξαιρόμενα. We have already been told that residue rises up and produces ulcers (cf. ἐξαίρεται at 13.88), and that in a similar manner scab, scurvy and leprosy occur (14.89–91). That might encourage us to limit ἅπαντα . . . τοιαῦτα in 16.105–6 to road sores, discussed at the end of section 15, and to connect τὰ ἐξαιρόμενα with the phenomena mentioned earlier in sections 13–15. Nevertheless, it is more likely that Theophrastus is looking forward to the pimply swellings mentioned in the next sentence, 16.108–11. They too are

¹¹² P. Nixon, *Plautus* (Cambridge: Harvard 1917), 2:vi.

¹¹³ The presence of τοὺς at 15.104 rules out σφυρά, neuter "ankles," as a simple supplement, but the corruption may be greater than a single word. πόδας, "feet," is compatible with τοὺς, but that would still leave the letters μει unexplained.

not benefited by being moved (16.110–11, picking up line 106). They are best left alone or treated with a mild douche (see the note on 16.114–15).

16.112 *χυλῶν*] Here *χυλός* is used of the juice of plants. See the note on 13.86.

16.113 *θερμολουσίαις ἢ ψυχρολουσίαις*] The reading of A, *θερμολουσίας ἢ ψυχρολουσίας ἢ ψυχρολουσίας*, is corrupt. In codex D, the third member is omitted; in codex B, the ending of the two remaining nouns is changed, apparently by a second hand, to dative plural: *θερμολουσίαις ἢ ψυχρολουσίαις*. In the editions of Furlanus, Schneider and Wimmer, dative singular occurs, but in his notes, Schneider suggests dative plural (vol. 4 p. 786). I have preferred dative plural, both because the loss of iota is easy to imagine and because keeping the final sigma avoids hiatus. See Einarson p. xxxii.

16.114–15 *περικλύσει χλιαρᾷ μὴ πολλῇ. καθίστησι γὰρ αὕτη μάλιστα*] The first word of the lemma is a conjecture. Codex A has *περικαύσει*. If the text of A is not corrupt, then Theophrastus appears to be recommending an encircling cauterization which is limited in both temperature and duration. Presumably the burning would be accomplished by a heated iron. The procedure is said to have a settling effect. Perhaps the heat effects revulsion; cf. 14.93. In any case, the cauterization need not result in new swellings; cf. *On Fire* 62. Nevertheless, the idea of treating pimply swellings by encircling cauterization, *περικαύσει*, seems odd. At one time I thought that Theophrastus might be referring to the use of a bronze cupping-glass.¹¹⁴ For not only is the cup heated, but it also encircles the skin wherever it is placed. But the cup does not achieve its effect by burning. Rather, a partial vacuum is formed within the cup as it cools, and that creates a drawing action. Settling may follow, but that is not the primary effect.

Most likely, the text is corrupt. Coray has suggested reading *πυριάσει*. Theophrastus would then be recommending a vapor bath which is warm, not intensely hot, and of limited duration. See *On Fire* 37. A different conjecture, that printed in the text and in the lemma above, is *περικλύσει*. It is

¹¹⁴ The bronze cupping-glass is the subject of a riddle, cited by Aristotle in both his *Rhetoric* 3.2 1405b1–2 and his *Poetics* 22 1458a29–30: ἄνδρ' εἶδον πυρὶ χαλκὸν ἐπ' ἀνέρι κολλήσαντα, "I saw a man glue bronze on a man with fire."

reported in the Greek Dictionary, LSJ s.v. περίκλυσις 2 and περίκλυσις,¹¹⁵ and is especially attractive for two reasons. First, lambda is easily confused with alpha: Λ has become Α. Second, in the immediately preceding portion of this section of *On Sweat*, Theophrastus has rejected the use of hot and cold water treatments. As an alternative he may well want to recommend the use of a mild rinse: περικλύσει χλιαρῶ.¹¹⁶

17.119 Ἀντιφάνης ὁ Δῆλιος καὶ Ὑριάδας] The two persons named here are otherwise unknown.

18.121–2 καίπερ θερμὰ τὴν φύσιν ὄντα καὶ ὑγρὰ καὶ τοῦ ἰδρῶτος ἐκ τούτου πως γινομένου] The first word of the lemma, καίπερ, is an emendation found in the margin of codex B. καθάπερ is the reading of codex A. Photius has καίτοι (278 528b38). The reading of Photius makes for an easy text—καίτοι meaning “although” underlines the puzzling aspect and therefore the need for explanation—but καίπερ, printed by Furlanus, Schneider and Wimmer, is closer to the manuscript reading and does everything that καίτοι does.¹¹⁷

The variation in construction after καίπερ—nominative participle in agreement with the subject together with a genitive absolute—is noteworthy but not grounds for emendation. For variation in construction, see 19.130–1 (nominative participle plus genitive absolute) and 20.138–9 (genitive absolute plus nominative participle).

Citing Photius, who has ἐξ ὧν (278 528b39), Schneider vol. 4 p. 787 proposes reading ἐκ τούτων, plural, instead of ἐκ τούτου with codex A. He

¹¹⁵ I am grateful to Herwig Görgemanns for calling my attention to this conjecture.

¹¹⁶ A comparable use of the noun, περίκλυσις, is unknown to me; in Aelian, *The Nature of Animals* 16.15, the noun is used of a flood which encircles the hillocks in which ants have constructed homes. However, the cognate verb, περικλύζειν, is used for a thorough washing in pseudo-Aristotle, *On Wonderful Things* 91 837b21: τὸ παιδίον ὕδατι περικλύσασθαι, “having washed the infant all around.” The simple verb κλύζειν is common in the sense of washing and rinsing; see LSJ s.v.

¹¹⁷ Although καίπερ is most likely the correct reading, I want to call attention to a singular occurrence of καθάπερ, listed by LSJ s.v. καθά II. I am thinking of Dio Cassius 37.54, where we read that Caesar courted the favor of Pompey and Crassus so shrewdly that he attached them both simultaneously to himself although they were acting against each other: ὥστ’ ἀμφοτέρους ἅμα καθάπερ ἀντιπράττοντάς σφισι προσθέσθαι. Here we have καθάπερ used together with a participle in order to call attention to a remarkable aspect of the situation under discussion. Similarly at *On Sweat* 18.121, if we keep the reading of codex A, καθάπερ might be said to introduce an important—surprising—aspect of the phenomenon in question. Of course, Dio Cassius is a later author, 2nd and 3rd c. A.D., and Cary, following Reim, has changed καθάπερ to καίπερ (in the Loeb edition of Dio, vol. 3. p. 186); but it is that change which may not always be correct.

may be correct, especially as other passages treat heat and moisture as the sources of sweat. See 23.160–1, 35.225 and 40.249–50: in the first and third of these passages, we find the dual ἐξ ἀμφοῖν. Nevertheless, it seems quite possible that Theophrastus here uses the singular pronoun inclusively to cover a complex condition in which both heat and moisture play a role. The possibility is perhaps strengthened by the fact that the words θερμότης and ὑγρότης do not precede. Rather, Theophrastus has spoken of young children being hot by nature and moist, θερμὰ τὴν φύσιν ὄντα καὶ ὑγρὰ, so that an inclusive reference to their natural condition seems entirely in order.¹¹⁸

18.123–4 ὅτι πυκνὸς ὁ χρῶς τῶν παίδων, πυκνότατος δ' ὁ τῶν παιδίων, ὥσπερ συγκεκλειμένους ἔχων τοὺς πόρους] In codex A, παίδων and παιδίων are reversed. That seems quite wrong, so that the correction of Grangerius has been adopted by Schneider and Wimmer. Furlanus is exceptional in that he prints the manuscript reading, but translates as if the text were corrected. The excerpt of Photius has πυκνότατοι τῶν παίδων οἱ χρώτες (278 528b40), which supports the reading of A. Since Photius often preserves a correct reading, we may be tempted to doubt the correction of Grangerius. Nevertheless, we must also remember that Photius and codex A may share an error.¹¹⁹ The reversal of παίδων and παιδίων in 18.123–4 appears to be just such an error.

Children and young children have difficulty sweating, because the density of their skin causes the pores to close up. Here the condition is natural and will change as the child matures. When he reaches adolescence, the pores will be open (8.47–8). On two other occasions, Theophrastus refers to closed pores. At 22.148 he tells us that the pores of persons who fail to take exercise are closed up on account of not being used. In this case, a change can be effected by altering one's life style. At 25.169 we are told that men who exert themselves restrain their breath, and that causes the vessels to inflate and the pores to be closed. Here change occurs when exertion ceases and breath is no longer restrained.

19.124–5 ἡ θερμότης ἐπικρατοῦσα πέττει διὰ τὴν αὔξησιν] Here the verb ἐπικρατεῖν is used metaphorically of digestion. In this use, it

¹¹⁸For two different cases, τὸ ὀπισθεν and τὸ ἄνω, in which I have resisted changing a collective singular to plural, see 32.201 and 35.224 and the discussions *ad loc.*

¹¹⁹Burnikel p. 132.

occurs already in Hippocratic writings. See *On Ancient Medicine* 3 and 4.¹²⁰ In the former passage it is related to growth, αὔξησις, as here in *On Sweat*. On the connection between growth and concoction, πέττειν, cf. *On Sweat* 7.45.

19.126–7 εὔρους γὰρ καὶ ὥς ἐπίπαν ὑγροτέρα (ἡ) τῶν παιδίων] The lemma involves two emendations: εὔρους replaces εὔροα, which is the reading of codex A, and ἡ has been added where codex A lacks a definite article. I have accepted the emendations, for they give a readable text and find support in Photius' excerpt. Nevertheless, it should be noted that codex S offers a possible text involving a single emendation: instead of ἡ, τὰ is added before τῶν παιδίων, and εὔροα is left unchanged. With τὰ we understand σώματα, and εὔροα is construed as the neuter plural agreeing with τὰ σώματα. We may compare the Hippocratic *Aphorisms* 2.9, where we read: τὰ σώματα χρή, ὅκου ἂν τις βούληται καθαίρειν, εὔροα ποιεῖν; "In cases where one wishes to produce evacuation, it is necessary to bring it about that the bodies (in question) are characterized by an easy flow." Given the elliptical nature of the text of *On Sweats*, understanding σώματα with τὰ seems not impossible, but it must, I think, be admitted that not only the absence of an explicit reference to the body in the immediate context but also the references to the intestines in what precedes and what follows (19.126, 20.133) speak for the reading of the lemma.

19.127 οἱ δὲ γέροντες] The aged men (γέροντες) referred to here are not to be confused with the mature men (ἄνδρες) mentioned in 18.120. Aged men are first mentioned at 7.43–4.

19.128 ἀλλὰ ξηροί] The idea that aged men are dry is a commonplace. See, for example, Aristotle, *On Length and Shortness of Life* 5 466a19, b14 and *Generation of Animals* 5.4 784a34. But contrast the Hippocratic treatise *On Regimen* 1.33, where we are told that old men, πρεσβῦται, are moist.

19.128–9 καθάπερ ὕλην τινὰ ὑπάρχειν] After ὑπάρχειν Schneider supplies τὸ ὑγρόν. The supplement corresponds to the excerpt of Photius (278 529a4) and makes the text easier to read.¹²¹ Nevertheless, it

¹²⁰ Langholf p. 89–90.

¹²¹ But "easier" does not mean that the received text is hopelessly difficult. Given the preceding mention of moisture as a source of sweat (18.121–2) and the immediately preced-

is not clear whether the supplement is originally Theophrastean or an addition of Photius. Given the elliptical character of the text of *On Sweat*, it seems not unreasonable to attribute the supplement to Photius. For that reason I have not printed τὸ ὑγρόν, following Grangerius and Furlanus against Schneider and Wimmer. For other similar cases, see the notes on 8.47–9, 19.130–1, 20.134, 23.159–60 and 25.170–1.

On καθάπερ instead of ὥσπερ after a vowel, see Einarson p. xxxiii–vi.

19.129–31 ἄλλως τε καὶ αὐτὸ τὸ εὐπνουν καὶ μανὸν ἱκανὴν ποιεῖ τὴν ἔκκρισιν ἀεὶ τε συνεχῆς ὄν καὶ μὴ πολλῶν ἐνυπαρχόντων] In the first half of the lemma, Theophrastus explains that aged men do not sweat easily, because the ease of breathing and rarity of their skin makes the secretion sufficient. The relationship between ease of breathing and rarity was made clear earlier, when Theophrastus explained why the sweat of aged men is not malodorous: ease of breathing is caused by rarity of skin, and that condition is not productive of residue, so that nothing is secreted from which bad odor might arise (8.50–3). Now ease of breathing and rarity of skin are said to make the secretion sufficient. The secretion in question is not specified, but if the earlier passage is a guide, then we should think of moisture which is free of any malodorous residue (8.52–3). Nevertheless, there is a second possibility which suits the emphasis on ease of breathing and rarity of skin: namely, the secretion of πνεῦμα or breath. Within the earlier discussion of saltiness, Theophrastus spoke of the secretion of breath (ἡ τοῦ πνεύματος ἔκκρισις 2.14), which he characterized as imperceptible and on-going (“always” 2.15). The same idea is present in the second half of the lemma, ἀεὶ τε συνεχῆς ὄν, “being ever continuous” (19.130); it can be introduced to explain why older men have difficulty sweating. In their case, rarity of skin guarantees a constant flow of breath, and that in turn may ensure the removal of unwanted liquids. We may compare the Hippocratic treatise *On Diseases* 1.25, where the author speaks of liquefied phlegm and bile becoming vapor and passing out of the body mixed with breath. But here I am indulging in speculation.¹²²

The words of the second half of the lemma, ἀεὶ τε συνεχῆς ὄν καὶ μὴ πολλῶν ἐνυπαρχόντων, are awkward. Photius has καὶ τῷ συνεχῶς

ing reference to the dryness of aged men (19.128), understanding some word for moisture is no great feat of imagination.

¹²² An objection to comparison with *On Diseases* 1.25 might be that vaporization is said to be caused by heat. That is sensible enough; but heat is one of the things lacking in aged men. Indeed, lack of heat might be given as a reason for difficulty in sweating.

γίνεσθαι καὶ τῷ μὴ πολλὰ ἐνυπάρχειν τὰ ὑγρά (278 529a6–7). That gives a balanced construction but leaves open what the subject of γίνεσθαι is. Henry's translation of the Photius passage ("tant parce qu'elle est constante qu' à cause du peu d'abondance des humeurs") appears to make τὴν ἔκκρισιν (from 529a5–6 = 19.130) the subject. Wimmer offers a translation of the Theophrastean text ("cum semper continua sit neque magna humoris copia insit") which does the same. If we compare 2.13–15 and 8.50, it seems likely that Theophrastus is thinking of the continuous ventilation which is made possible by rarity of skin. For this reason, it is tempting to read διύοντος for ὄν at 19.130 and to understand πνεύματος as subject.¹²³ Nevertheless, it seems most probable that the words in question are but one more example of the unpolished, compressed style which pervades the entire opusculum. Theophrastus mentions two causes and shifts construction. The first is presented in the neuter singular referring loosely to the subject, τὸ εὔπνουν καὶ μανὸν; the second shifts to a genitive absolute; cf. 18.121–2. It is problematic whether Theophrastus expressed the subject of the genitive absolute or Photius felt the need to add it in his paraphrase. Certainly the addition of τῶν ὑγρῶν at 19.131 would facilitate comprehension, but it is not necessary. In my judgment, it is attributable to Photius, who rephrased the Theophrastean text, introducing balance—τῷ is used twice—and adding τῶν ὑγρῶν for the sake of clarity. See the preceding note on the addition of τὸ ὑγρόν at 19.129.¹²⁴

19.132 ἀπέρασις] The "carrying off" of moisture. For Theophrastus' use of the word ἀπέρασις in his botanical writings, see *Plant Explanations* 2.8.4, 9.8, 11.11; for the cognate verb, see 1.17.10.

20.134 ἡ ἐπίρροια] After these words Photius adds τοῦ περιττώματος (278 529a8). That is almost certainly a case of adding to the Theophrastean text for the sake of clarity. Moreover, the addition is problematic. In the immediately preceding lines, Theophrastus has emphasized the dryness of aged men (19.128, 131), and he goes on to speak of the moisture which flows to the bladder (20.134–5). That suggests understanding some word for moisture with ἐπίρροια. It is, however, unnecessary to force a decision, for the moisture (τὸ ὑγρόν) which flows to the bladder in order to be expelled as urine is a residue (περίττωμα).

¹²³ Cf. 1.3, where διύοντος is an emendation, on which see the note on 1.2–4.

¹²⁴ Cf. also the addition of περίττωμα and of περιττώματος at *Library* 278 528b31 and 529a8, corresponding to *On Sweat* 2.9 and 20.134. Neither is necessary; see the notes *ad loc.*

20.135–6 οἷς δὲ . . . οὗτοι δὲ] Regarding the repetition of δέ, see Denniston, s.v. δέ II.1 p. 178 on the apodotic δέ after a relative protasis. See also above, the note on 1.5–6, and below, the note on 28.186.

20.135 πάλιν] For πάλιν expressing opposition, cf. 4.26 and 21.142.

20.136–7 ἡ γὰρ ἐνταῦθα μεριζομένη περίττωσις] On the distribution of residue between the intestines and the bladder, cf. Aristotle, *History of Animals* 1.2 489a2–8. For περίττωσις instead of περίττωμα, cf. 489a7.

20.137 πρὸς τὰς σάρκας] Cf. 2.10 ἐν . . . τῇ σαρκί, and see the note on 2.10.

20.138–9 καὶ ἀπέπτων τῶν σιτίων ὄντων καὶ ἀγρυπνήσαντες εὐίδρωτες μᾶλλον] These words appear to lack balance when compared with the paraphrase offered by Photius: οἱ μὴ πέψαντες τὰ σιτία καὶ οἱ ἀγρυπνήσαντες εὐίδρωτες (278 529a10–11). That encouraged Schneider vol. 5 p. lix to suggest changing the genitive absolute of the Theophrastean text, ἀπέπτων τῶν σιτίων ὄντων, to read: οἱ μὴ πέψαντες τὰ σιτία. The change seems misguided, for Theophrastus' text is marked by imbalance and frequent use of the genitive absolute. For the same reason, we should not be tempted by the conjecture of Grangerius: ἄπεπτα τὰ σιτία ἔχοντες. Neither conjecture is recorded in the *apparatus criticus*.

The pairing of unconcocted food with persons who go sleepless reflects a causal connection. Sleep produces concoction (20.140), and failure to sleep has the opposite effect. Cf. the Hippocratic treatise *On Regimen in Acute Diseases* 49, where we are told that persistent sleeplessness causes drink and food to be unconcocted in greater degree.¹²⁵ Cf. also Theophrastus' work *On Fatigue* 4, where the Eresian connects fatigue with lack of sleep. The latter is said to prevent concoction (ἢ τε ἀγρυπνία κωλύει τὴν πέψιν), which results in an abundance of moisture, and that in turn produces fatigue. Presumably the same abundance of moisture makes a person sweat more easily.

20.140 τὸν ὕπνον ἐκπέττειν] Cf. *On Fatigue* 16: ὁ ὕπνος πεπτικόν.

21.141 ἄτοπον δ' ἂν ἐκείνο δόξειε καὶ ὥσπερ ὑπεναντίον] Cf. 7.41 ἄτοπον δ' ἂν δόξειε τοῦτο εἶναι καὶ ἐναντίωσιν τιν' ἔχον.

¹²⁵ See Langholf p. 90–1.

21.141–4 οἱ γυμναζόμενοι καὶ εὖ ἔχοντες εὐίδρωτες καὶ πάλιν οἱ ἀγύμναστοι <καὶ> κακῶς <ἔχοντες> καὶ <οἱ> πεπεμμένην δὲ καὶ ἄπεπτον ἔχοντες τὴν τροφήν] The text of codex A is messy. Toward the beginning of the lemma, the reading εὖ ἔχοντες εὐίδρωτες is an emendation; codex A has συνέχοντες ἰδρῶτες. What follows in A—i.e., what follows in the lemma without the supplements—is difficult at best. If ἔχοντες toward the end (before τὴν τροφήν) can be used twice so that it need not be supplied earlier (after κακῶς), then the text of A might be translated: “men who exercise themselves and are in good condition sweat easily, and again those non-exercisers who are in bad condition and have food concocted and unconcocted (sweat easily).” That would give two major groups, exercisers in good shape and non-exercisers in bad shape; the latter would be either subdivided into those having concocted and those having unconcocted food, or simply characterized as having concocted and unconcocted food. In view of what follows, that seems possible, for there is no explicit reference to exercisers in good shape who have unconcocted food. That might even be expected, for part of being in good shape is having a body that normally produces adequate concoction, so that sweating is rarely needed to supplement evacuation *via* bladder and intestines.

Nevertheless, it seems likely that the text of codex A is marred by omission. That is suggested not only by the need to take ἔχοντες twice but also by the combination καὶ . . . δὲ. Earlier in the treatise at 5.30–1 and 6.40, this combination is used to introduce a final coordinate item¹²⁶ and not a subdivision or characterization of what precedes. Similarly here at 21.143, Theophrastus seems to use the combination to introduce a coordinate item; if we follow Photius (278 529a12–15), the combination introduces the second of two pairs. First, Theophrastus mentions men who exercise and those who do not. Second, he mentions men who have food concocted and (those who have it) unconcocted. If that is correct, the addition of the definite article οἱ seems necessary.

The excerpt of Photius (278 529a12–22) introduces difference in degree. Exercisers in good condition are said to sweat more easily than non-exercisers (a12–13). An explanation follows: in the case of exercisers, their bodies are rare in texture and their pores open, but non-exercisers have closed pores on account of not being used (a15–19). Whether that reflects the original Theophrastean text or Photius’ own attempt to make sense of a difficult text is problematic. In any case, Photius’ excerpt does

¹²⁶ Denniston, s.v. καὶ δέ: καὶ . . . δέ no. 2 iii p. 202–3.

not recognize a difference in degree between those who have concocted food and those who do not. They are introduced as a pair and said to sweat easily (a13–15), albeit for different reasons (a19–22).

21.145–6 ἔτι δὲ (τῷ συνήθεις εἶναι πρὸς) τοὺς ἰδρῶτας] The supplement is from Photius (278 529a17–18), and in regard to content it seems certain. After τοὺς ἰδρῶτας Photius has εὐἰδρωτες. That fills out the sentence nicely, but it seems unnecessary, for the beginning of section 21 makes clear that different cases of ease of sweating need explanation, the first being that of men who exercise themselves and are in good condition (21.141–2). Hence the reader (or user of these notes) readily understands εὐἰδρωτες (or an equivalent) earlier in the sentence after (οἱ γὰρ) γεγυμνασμένοι (21.144).

22.146–7 διὰ τοῦτο γὰρ καὶ οἱ μὲν χρονίως ποιοῦμενοι τὰς ἀφιδρώσεις εὐἰδρωτες) * * * ὅτι] Grangerius changed μὲν to μὴ; Burnikel has proposed μὲν μὴ, suggesting that μὴ has fallen out through haplography.¹²⁷ Whether such an emendation is in order depends on how one construes χρονίως, which is rare in prose (LSJ s.v. χρόνιος II). If we take the adverb to mean “after a long time,”¹²⁸ then μὴ is needed, for the habituation which leads to ease in sweating is incompatible with long gaps between periods of sweating-off. However, if we take the adverb to mean “for long periods” and understand that it goes closely with ποιοῦμενοι, producing extended periods of sweating-off, then the text of codex A should be maintained. The first possibility finds some support in *Problems* 2.8, where we are told that men sweat more, when it is not through long intervals (μὴ διὰ πολλοῦ χρόνου) that they make use of sweating-off (867a12–13). However, the pseudo-Aristotelian text is problematic,¹²⁹ and in any case χρονίως does not occur. We should, I think, take our cue from the use of χρονίως in Aristotle’s *On Generation and Corruption* 1.10 328a35, where the adverb describes the duration of a process and not the length of an intervening period. That fits the second possibility better, so that I prefer to leave the μὲν-clause as found in codex A (i.e., no μὴ or μὲν μὴ) and to imagine that μὴ occurred in the δὲ-clause which has fallen out along with part of εὐἰδρωτες. We might, for example, supply εὐἰδρωτες,

¹²⁷ Burnikel p. 140 n. 18.

¹²⁸ Grangerius f. 19: “longis intervallis” and Burnikel p. 140: “nach langer Zeit” and p. 141 “in langen Abständen.”

¹²⁹ See Flashar p. 426 and Burnikel p. 140 n. 21.

οἱ δὲ μή, οὐχ), which reverses and slightly shortens the emendation proposed by Burnikel. But there is no certainty here.¹³⁰

22.150–2 οἱ δὲ κακῶς ἔχοντες καὶ μὴ πεπεμμένην τὴν τροφήν τῷ πλήθει τῆς ὑγρότητος εὐίδρωτες] The lemma is the reading of codex A except for πεπεμμένην, which is an emendation (first appearing in codex B) for πεπηγμένην in A. The participle ἔχοντες must be taken twice and in two different constructions: first with the adverb κακῶς and second with the accusative phrase μὴ πεπεμμένην τὴν τροφήν. In a treatise whose style is often highly condensed, such double usage is not impossible and perhaps to be expected.¹³¹ To be sure, Photius does have ἔχοντες after μὴ πεπεμμένην, but he omits the words οἱ δὲ κακῶς ἔχοντες, i.e., the first construction, so that he is forced to add ἔχοντες in the second construction.

Codex V has a lacuna of c. 25 letters after καὶ μὴ. The lacuna corresponds exactly with the division between folio 113^r and 113^v in codex M, from which codex V was copied.¹³² Certainty here is impossible, but my guess is that the scribe of V assumed that some words were omitted in M when the scribe of that codex moved from recto to verso. The lacuna in V is exceptionally long; it is just short of two inches, which is noticeably longer than other lacunae in codex V.¹³³ Perhaps the scribe believed that a sizable chunk of text had fallen out. Alternatively, he may have simply left a large gap without giving much thought to what might be missing, if anything.¹³⁴

¹³⁰ Since the conclusion of section 21 (assuming that the supplement in lines 145–6 is correct) concerns men who take exercise and have become habituated to sweat, it would seem natural for section 22 to begin by mentioning persons who, through long periods of sweating-off, have acquired a disposition to sweat easily. Hence καὶ in 22.146 seems to announce that a related group is being introduced: “those *too*.” Men who do not engage in long periods of sweating-off might then be mentioned second and in telegraphic fashion.

¹³¹ In the case in question, double usage is facilitated by the proximity of the two constructions and by the fact that ἔχοντες comes last in the first construction and therefore immediately precedes the second.

¹³² According to Burnikel p. 44, an intermediary between M and V cannot be demonstrated. In any case, the existence or non-existence of an intermediary does not affect the suggestion which I am making. Either the lacuna first appeared in V, or it was transferred to V from an intermediary in which it first appeared.

¹³³ In codex V, the lacuna at 3.16 approaches one and one-half inches. That at 22.147 is difficult to measure for it runs over two lines, but it, too, can only be said to approach one and one-half inches. Other lacunae are approximately one inch in length or shorter. I am referring to lacunae in *On Sweat* as presented in codex V. I have not studied lacunae in other treatises contained in the codex.

¹³⁴ Since all codices are ultimately dependent on codex A, it is generally true that the length of lacunae in dependent codices is of little importance in comparison with the

22.152–4 ἀλλ' ἐκεῖνοι μὲν μετὰ πόνου καὶ ἀεὶ τὸ σύμμετρον ἀφαιροῦντες, οὗτοι δὲ καὶ αὐτομάτως καὶ ὡς ἂν τύχῃ καὶ τὸ ὅλον ἀεὶ περιττώματος ἔχοντες πλῆθος] These lines may be compared with *Problems* 2.41 870b14–26.¹³⁵ There is striking agreement in vocabulary (μετὰ πόνου—ὑπὸ τῶν πόνων *Probl.* 870b15–16; τὸ σύμμετρον—τοῦ συμμέτρου *Probl.* 870b24–5; αὐτομάτως—ἀπὸ τοῦ αὐτομάτου *Probl.* 870b14), and both texts tell us that sweat arising on its own—that which is called “automatic” (870b14)—is undesirable. Nevertheless, the subjects under discussion are not identical. In *On Sweat* the question is why both men who are healthy and those who are unhealthy sweat easily. Sweat arising on its own without exertion is associated with unhealthy persons. In *Problems* 2.41, the question is why for healthy men sweat arising on its own is worse than that arising with exertion. Sweat arising on its own is described as a sign of disease (870b24–5), but it is a disease arising in a normally healthy individual. The case of the dispositionally unhealthy person is not discussed.

The adverb ἀεὶ occurs twice in these lines. In line 152, it clearly means “on each occasion,” though in context the translation “always” seems natural (cf. 12.82 with the note *ad loc.*) In line 154, the meaning is less clear. Perhaps Theophrastus is saying that dispositionally unhealthy people suffer continuously from a (large) quantity of residue: i.e., they have “at all times” an unhealthy amount. That is, of course, a generalization, which Theophrastus makes clear by the use of τὸ ὅλον.

The adverb αὐτομάτως (line 152) is opposed to μετὰ πόνου (line 152). Men who are in good condition sweat “with exertion,” but those who are in bad condition sweat “automatically,” i.e., without engaging in exercise. Here αὐτομάτως is not used of a phenomenon that is continuous (people who have a bad bodily condition do not sweat all of the time), and that contrasts with 2.11, where αὐτομάτως is used of urine which is always, i.e., continuously, accumulating. Moreover, in the case of urine, being automatic is desirable (nature itself is doing the work 2.11), but in regard to sweat, it is only desirable if unwanted residues are being removed (13.83–6). Otherwise, it is a sign of poor health.

length of lacunae in codex A. Nevertheless, the lacuna under discussion is exceptional in that it does not reproduce a lacuna in A. For me that raises the question whether some of the lacunae in A itself are the creation of the scribe, or possibly misplaced, and whether the length of lacunae in codex A always reflect what has dropped out. See the notes on, e.g., 1.2, 9.54–5 and 14.95.

¹³⁵ Burnikel p. 141 n. 23.

23.154–61 δοκοῦσι δέ τινες καὶ ἐν τῷ χειμῶνι μᾶλλον εὐίδρωτες—τοῦ δὲ ὡς πάσχοντος] These lines concern some people, *τινες*, who seem to sweat more easily in the winter. *Problems* 2.21 868a26–34 is not a close parallel, for there the question is whether it is more necessary to induce sweating in summer or in winter. At *On Sweat* 23.157, collquescence, σύντηξις, is mentioned, and that might suggest the importance of removing excessive fluids in the summer (cf. *Probl.* 868a31–3), but the importance of such removal is not affirmed. In fact, the reference to collquescence occurs as part of a quasi-footnote in which extremes of weather are being removed from consideration.

23.156–7 ἡ μὲν γὰρ οἶον ῥίγος ἂν ποιήσειεν] When men are in good health, very cold weather causes shivering, and shivering *qua* motion heats the body. Normally sweating is not a consequence. However, when men are not in good health, shivering is frequently, though not always, followed by sweating. On Hippocratic case studies, see Langholf p. 82–8.

23.158–9 τὴν δ' αἰτίαν ταύτην ὑποληπτέον, εἶπερ ἀληθές, ὅτι] Cf. 18.122–3 τήνδε τὴν αἰτίαν ὑποληπτέον, ὅτι. Like τήνδε in line 122, ταύτην in 158 is forward looking; cf. ἐν τούτοις ἡ αἰτία at 25.168. An especially close parallel is provided by *On Winds* 60: ταύτην ὑποληπτέον τὴν αἰτίαν, ὅτι.

The phrase εἶπερ ἀληθές is not used in reference to the forthcoming explanation; rather it underlines the oddity of the fact which is about to be explained.¹³⁶ In *On Fish* the phrase is used in regard to the “sleeper-out”: θαυμασιώτατον δέ, εἶπερ ἀληθές, το τοῦ ἐξωκοῖτου καλουμένου (1.3, RUSCH vol. 5 p. 360.3–4 Sharples).

23.159–60 ἡ μὲν ξηρὰ τῶν ὑγρῶν, ἡ δὲ ψυχρὰ ἀντιπερίστασιν τινὰ τοῦ θερμοῦ (ποιεῖ)] Codex A has the following: ἡ μὲν ξηρὰ τῶν ὑγρῶν· ἡ δὲ ὑγρὰ εἶναι περίστασιν τινὰ τοῦ θερμοῦ. There are at least three difficulties here. First, the subjects ἡ μὲν ξηρὰ and ἡ δὲ ψυχρὰ lack a noun. Schneider supplies ὥρα after ξηρὰ, which captures the sense.¹³⁷ In addition, coming immediately after ξηρὰ, ὥρα may

¹³⁶ Normally a man sweats less or not at all during winter. A modern physiologist would say that the body does not become overheated, so that there is no need to cool the body through eccrine sweat. (On eccrine glands see above: A Preliminary Note on Modern Accounts of Sweat.)

¹³⁷ Cf. *Problems* 35.4 965a4–5, where we are told that the concentration of heat and cold in the body takes place inversely to the season: ἀντιπερίσταται ἐναντίως τὸ ψυχρὸν καὶ τὸ θερμὸν τῇ ὥρᾳ.

have fallen out on account of homœoteleuton. Nevertheless, Wimmer does not adopt the supplement, and Antonio Battezzore has pointed out to me that ὥρα can be understood and need not be expressed, for the discussion concerns winter and summer: χειμῶν and θέρος are mentioned explicitly in line 155, and referred to by ἐκατέρου and ἐν ἐκατέρῳ in 156 and 158. That is correct, and I have chosen not to print the supplement. The treatise is often elliptical, and my general preference is to avoid unnecessary supplements.¹³⁸

Second, at the beginning of the δὲ-clause, codex A has ἡ . . . ὑγρὰ. That cannot stand, for it does not provide the proper contrast to τοῦ θερμοῦ. Of course, the Greek winter is wet, but a reference to cold is needed. Hence the emended subject ἡ . . . ψυχρὰ.

Third, the subsequent words εἶναι περιστάσιν τινα are also corrupt, and there can be little doubt that the correction ἀντιπερίστασιν τινα . . . (ποιεῖ) is sound. Theophrastus is explaining increased sweat in winter by introducing the doctrine of ἀντιπερίστασις. The cold air which surrounds a person in winter concentrates and intensifies bodily heat,¹³⁹ and in some people that causes the moisture within to be exuded as sweat. For ἀντιπερίστασις as a cause of increased sweat during sleep, see 40.248–9.

23.160–1 ὁ δὲ ἰδρὼς ἐξ ἀμφοῖν, τοῦ μὲν ὡς ποιοῦντος τοῦ δὲ ὡς πάσχοντος] I.e., sweat results from both warmth as an efficient cause and moisture as a material cause; cf. 18.121–2, 19.128–9, 35.225 and 40.249–50.

23.161–2 ἔτι δὲ τοῦ θέρους καὶ διαιτῆσονται τὸ πολὺ τοῦ ὑγροῦ] The idea expressed here is simple enough: in summer men tend to drink much liquid.¹⁴⁰ Nevertheless, the statement of this idea fits poorly with what precedes. As Schneider suggests, it may be all that remains of a new problem: one which concerns why most people sweat more in the summer than in the winter. Cf. *Problems* 2.40, where the problem is first

¹³⁸ The qualifier “unnecessary” is important; later in the sentence, i.e., at the end of the lemma, I do accept a supplement, ποιεῖ. On the avoidance of supplements, see the notes on 8.47–9, 19.128–9, 130–1 and 20.134, as well as the Introduction, Section I.

¹³⁹ Cf. Theophrastus, *On Fire* 13. Burnikel p. 164 cites our passage within a larger discussion of ἀντιπερίστασις. For Theophrastus’ use of the term in a discussion of fainting and its cure, see text 345.29 FHS&G; for his use of the term in botanical writings, see, e.g., *Plant Explanations* 1.12.3, 1.13.5 and the note of Einarson and Link in the Loeb edition p. 94–5.

¹⁴⁰ Cf. *On Fatigue* 17: in summer, drinking fluid is a recommended treatment for fatigue.

stated and then answered in terms of the rarity and thickness of bodies and the natural heat which in summer dissolves moisture into breath. After that, reference is made to the fact that men consume much liquid during summer and a small quantity in winter: ἔτι δὲ καὶ τοῦ μὲν θέρους πολὺ προσφερόμεθα τὸ ὑγρὸν, τοῦ χειμῶνος δὲ τοῦναντίον. (870b12–13). Here ἔτι δὲ introduces a further consideration which develops and closes a discussion already in progress. The same is likely to have been true of ἔτι δὲ at *On Sweat* 23,161. Cf. ἔτι δ' at 33.212, and see the note *ad* 33.212–13.

24.163–5 διότι δὲ καὶ (τὰ) ἄνω μᾶλλον ἰδρῶσι τρόπον τινὰ φανερόν· καὶ γὰρ τὸ ὑγρὸν καὶ τὸ πνεῦμα καὶ τὸ θερμὸν ἐνταῦθα μᾶλλον, ἐξ ὧν καὶ δι' ὧν ὁ ἰδρώς] The lemma contains the whole of section 24. It is remarkable for at least three reasons. First, the previous discussions are considerably longer: 22 lines (sec. 2–4), 40 lines (sec. 5–10), 14 lines (sec. 11–12), 37 lines (sec. 13–17), 43 lines (sec. 18–23). Now in section 24 a topic is introduced and discussed in little more than two lines. Second, section 24 seems oddly placed not only because it follows fuller discussion but also because it relates closely to sections 32 and 33: all three sections deal with the occurrence of more sweat on the upper body or parts thereof. Third and most striking, we have the first occurrence of ἰδρῶσι—present active indicative 3rd person plural—in *On Sweat*. In subsequent sections, it recurs six times. An alternative form, ἰδροῦσι, also occurs in *On Sweat*. It first occurs in section 27 and recurs three times. There are no occurrences of either form in sections 1–23.¹⁴¹ Taken together, the three reasons suggest that section 24 marks a new beginning or turn in the treatise.

To explain why men sweat more on the upper parts of the body, Theophrastus lists three items, moisture, breath and heat, which are present to a greater degree in the upper body. He then adds “from which and through which sweat occurs.” How do the preceding three items relate to the two prepositional phrases: ἐξ ὧν (“from which”) and δι' ὧν (“through which”)? Moisture seems to fall under “from which,” for when moisture is secreted through the skin the result is sweat. But it is also true that sweat can arise from breath when it is cooled (ἐκ τοῦ πνεύματος ἀποψυχομένου 26.178). In that case, “from which” involves a change of state: from vapor to fluid.¹⁴² On the other hand, breath can also be an efficient cause which

¹⁴¹ See the Index of Important Words and the Introduction, Section 1. Here at 24.163, ἰδρῶσι takes an accusative of specification; cf. 30.193–4 (διἰδρῶσιν), 32.201 and 33.207.

¹⁴² That is true whether cooling and condensation occur within (26.178–9) or outside

drives out moisture (ἡ διάστασις τοῦ πνεύματος ἐξωθεῖ 32.205–6); and both heat and breath can be spoken of as forces on account of which sweat occurs (διὰ . . . τὴν τοῦ θερμοῦ καὶ πνεύματος δύναμιν 2.12–14). Perhaps breath and heat as motive forces are meant to be covered by the phrase “through which,” but that phrase is better suited to refer to a conduit like the pores (διὰ τῶν πόρων 26.175–6). My guess is that Theophrastus has not expressed himself with care. His addition is intended only to underline that the preceding three items are important to the occurrence of sweating.

25.166 καὶ οὐδ’ οἱ πονοῦντες] The reading of codex A, καὶ ἰδοὺ πονοῦντες, is corrupt. Wimmer, in both his editions, and Burnikel, in his partial edition, print καὶ ὅτι οὐ πονοῦντες. That is a conjecture which Wimmer claims as his own.¹⁴³ He is, however, almost certainly following a suggestion made by Schneider. The latter cites Photius, who has ὅτι οὐ πονοῦντες (529a22–3), and proposes καὶ ὅτι οὐχ οἱ πονοῦντες (vol. 2 p. 613). However, ὅτι in the text of Photius is not part of the excerpt.¹⁴⁴ Accordingly I have rejected the conjectures of Schneider and of Wimmer-Burnikel, and printed the reading of the Aldine edition, καὶ οὐδ’ οἱ πονοῦντες, which is in fact the reading adopted by Schneider in his edition of the text (vol. 1 p. 818.8–9). What exactly Theophrastus wrote remains problematic, but at least the reading of the Aldine provides both the needed negative and a transitional word, without introducing ὅτι from Photius.

25.166 ἀλλ’ ὅταν πᾶσωνται μᾶλλον ἰδρῶσιν] The corresponding words in *Problems* 2.20, ὅτε πᾶσσονται ἰδροῦσιν (868a15), lack a comparative. For discussion of this difference and others, see the Introduction, Section 3.

25.167 κατέχοντες τὸ πνεῦμα] The idea that men who exert themselves (πονοῦντες, line 166, cf. 168) restrain or hold their breath (cf. ἡ κάθεξις τοῦ πνεύματος, lines 171–2) occurs elsewhere in *On Sweat*: 29.190, 33.212, 34.216–21. The idea comes from everyday experience (try lifting a heavy rock or pushing a loaded cart) and is mentioned by Aristotle in very different contexts. In the *Politics* 7.15, where Aristotle criticizes

of the body (1.3–4). Caveat: sometimes cooling and condensation within results in nausea instead of sweating (38.239).

¹⁴³ See the edition of 1862, vol. 3 p. xxvi.

¹⁴⁴ See the Introduction, Section 2.

Plato for not permitting young children to cry violently,¹⁴⁵ he tells us that crying promotes growth and is a form of exercise, for restraining the breath produces strength in those who exert themselves (ἡ γὰρ τοῦ πνεύματος κάθεξις ποιεῖ τὴν ἰσχὺν τοῖς πονοῦσιν), and in the case of children this takes place when they stretch themselves in crying (7.15 1336a34–9). In *On Sleep and Waking* 2, Aristotle argues that sleeping and waking originate in the heart, for it is here that perception and movement originate. In regard to the latter, he says that it is impossible to move or to do anything without strength, and holding the breath produces strength: breath from without in the case of creatures which inhale and connate breath in the case of those which do not (ἰσχὺν δὲ ποιεῖ ἡ τοῦ πνεύματος κάθεξις, τοῖς μὲν εἰσφερομένοις ἢ θύραθεν, τοῖς δὲ μὴ ἀναπνέουσιν ἢ σύμφυτος 456a16–19). In the second of these passages, connate breath is distinguished from the breath which comes from outside and is restrained by men and other creatures which inhale. In the first passage, there is no mention of connate breath, nor need there be. Aristotle is saying something quite simple. When children exert themselves, the alternation of inhalation and exhalation is interrupted. They hold the breath which they have inhaled, and in this way they gain strength. The application to *On Sweat* 25 is straightforward: people who exert themselves hold their breath, thereby gaining strength while interrupting the normal process of breathing in and out.

The preceding remarks are not intended to demonstrate that connate breath plays no role when men exert themselves. It is possible that Aristotle and, following him, Theophrastus would want to say that the desire to exert oneself finds material expression in connate breath. It contracts and/or expands (cf. Aristotle, *Movement of Animals* 10 703a19–23), and in so doing it initiates the process whereby breath is restrained. But even if that is what the two Peripatetics would want to say, it is true that *On Sweat* 25 says nothing which encourages identifying the breath which is restrained (i.e., the breath mentioned in line 167) with connate breath. Still less does section 25 say anything which justifies emending the text at 1.3 so as to create a reference to connate breath. See the note on 1.2–4.

25.168–70 πονούντων μὲν γὰρ ὑπὸ τοῦ πνεύματος αἱ φλέβες ἐμφυσώμενοι συμμύειν ποιοῦσι τοὺς πόρους] When men exert themselves, they restrain or hold their breath thereby gaining strength (see the preceding note). As a result, the vessels are inflated and that causes the

¹⁴⁵ Aristotle is criticizing Plato's *Laws* 7.3 791E4–792B8.

pores to close up. It is not clear how we are to understand this closing. For two different explanations, see the note on 25.172–4.

25.170–1 δι' εὐρυτέρων καθάπερ ἀνεφγμένων μᾶλλον ἐξέρχεται τὸ ὑγρόν] After μᾶλλον, Schneider adds τῶν πόρων. That would give the following translation: “the moisture passes through the pores which are wider and as it were opened up more.” The addition is, however, unnecessary (so obviously so, that I have not recorded it in the *apparatus criticus*) and another example of adding where context is sufficient to convey the intended meaning. See the notes on 8.47–9, 19.128–9, 130–1, 20.134.

I agree with Grangerius (*humor expedite magis pervadit*) and Furlanus (*magis excitatur sudor*) against Wimmer (*humor exit*): the adverb μᾶλλον should be taken with ἐξέρχεται. Theophrastus is repeating the idea expressed by μᾶλλον ἰδρῶσιν in the first sentence of section 25.¹⁴⁶

25.171 τὸ ὑγρόν] After these words Schneider prints 26.190–5. The rest of section 25 is his section 26.

25.171–2 καὶ ἡ κάθεξις δὲ τοῦ πνεύματος πληροῖ τὰς φλέβας ὥστε κωλύει διϊέναι] Theophrastus repeats what he has already said in 25.167–70. Here the repetition serves to introduce the comparison with the κλεψύδρα or water-catcher. For repetition elsewhere in the treatise; cf. 8.50–3 and see the note *ad loc.* The combination καὶ . . . δὲ is transitional, marking a weak stop and looking forward to the comparison which is new. See Denniston, *s.v.* καὶ δέ: καὶ . . . δέ 2 i p. 201.¹⁴⁷

Here Theophrastus speaks of preventing moisture from going through: κωλύει διϊέναι; there is no suggestion of degrees as there is in the preceding portion of section 25. That may give pause. Should we make the words κωλύει διϊέναι, together with the subsequent example of the water-catcher, central to a correct interpretation of sections 25–6? And should we say that the preceding references to degrees of sweat (25.166, 171) are misleading? I think not. Theophrastus' interest in degrees of sweat is confirmed by the concluding words of section 26: καὶ πλεῖον καὶ ῥᾶον ἐκπίπτειν (179).¹⁴⁸ The exceptional lines are 25.171–4. Theophrastus

¹⁴⁶ I have, however, translated “more moisture passes out” (“more” as an adjective), for that gives simple English and μᾶλλον has the same translation as above in line 166.

¹⁴⁷ This use of καὶ . . . δὲ may be distinguished from the use at 5.30–1, 6.40 and 21.143, where the combination introduces a new, last item in a series.

¹⁴⁸ Cf. 32.206.

wishes to illustrate the way flow can be impeded. As an example, he chooses the water-catcher, which is an instrument for picking up and transferring small quantities of water. Normally leakage is not a problem and degree of flow is not a consideration. Perhaps, then, consciously or unconsciously (most likely the latter), Theophrastus prepares for comparison with the water-catcher by speaking simply of preventing moisture from going through. He could after all add to his comments during lecture.

Schneider and Wimmer change the verb διῦέναι to ἐξιέναι, which occurs in *Problems* 2.1 866b11. That is a good example of overusing the *Problems* to make unnecessary changes in the text of *On Sweat*. Indeed, διῦέναι may be preferable. Theophrastus is speaking of holding the breath; in this context, it makes good sense to speak of moisture being prevented from going through (διῦέναι). Holding the breath inflates the vessels and that in turn causes the pores to close up, so that moisture is unable to go or pass through (διῦέναι) the pores, let alone pass out (ἐξιέναι) onto the surface of the skin.¹⁴⁹

25.172–4 καθάπερ τὸ ὕδωρ τὸ ἐκ τῶν κλεψύδρων, ὅταν γε πλήρεις οὔσας τις ἐπιλάβῃ] The κλεψύδρα or water-catcher has an opening at the top and numerous small holes at the bottom. When the opening above is covered, liquid cannot flow in or out. When it is uncovered, flow in either direction is possible. Hence, it had a domestic use as a tool for transporting liquids. See Empedocles' description of a girl playing with a water-catcher (31 B 100 DK = Aristotle, *On Respiration* 7 473b16–474a2). Anaxagoras referred to the water-catcher when criticizing the notion of void (59 A 68 = Aristotle, *Physics* 4.6 213a22–7, cf. 59 A 69 = ps.-Aristotle, *Problems* 16.8 914b9–915a24).

In regard to holding liquid, the water-catcher did not differ in principle from the water-clock, also called κλεψύδρα. Both instruments had an opening above, which could be covered to prevent the escape of liquid. The verb ἐπιλαμβάνειν (ἐπιλάβῃ in the lemma) is used for closing the opening at the top. In regard to the water-catcher, see *Problems* 2.1 866b13 and 16.8 914b12, 14; at 2.1 866b14 the noun ἐπιληψία also occurs.¹⁵⁰ For

¹⁴⁹ Concerning the prefix δι(α) and attempts to improve the text, see the note on οὐ διῦδρῶσιν at 30.193–4. See also Rispoli (1992) p. 75, who defends διαπέμπεται as against ἐκπέμπεται at *On Breath* 1 481a20. The latter emphasizes the final moment of expulsion, and the former focuses on the process which precedes.

¹⁵⁰ In the Loeb edition of the *Problems*, Hett translates κλεψύδρα with “water clock,” but it is the water-catcher which is under discussion. See Flashar p. 585. I am grateful to Bob Sharples for calling my attention to the different instruments called κλεψύδρα.

the water-clock, see Lysias, *Or.* 23.4, Isaeus, *Or.* 3.76 and Aristotle, *Constitution of the Athenians* 67.2–3.

The water-catcher is introduced by way of comparison (καθάπερ 172): just as covering the opening at the top of the water-catcher prevents water from escaping below, so inflating the vessels by restraining the breath prevents moisture from passing out through the pores onto the surface of the skin. If the comparison can be pressed, we may think of the vessels as porous: i.e., they have pores which are narrow passages with two openings. One opening is found where the pore attaches to the vessel and the second where the pore opens onto the surface of the skin. Inflation of the vessel causes the inner opening to close, and as a result little water passes to the surface of the body. But can the comparison with the water-catcher be pressed? It is clear that Empedocles used the comparison for a special purpose and ignored differences which might be important from another perspective.¹⁵¹ Similarly, Theophrastus seems to have had a particular purpose in mind. He wishes to illustrate the fact that the flow of moisture through a pore can be temporarily impeded; toward that end, he introduces a comparison with the water-catcher. Apparently he is not concerned that the comparison introduces difference. In particular, covering the top opening of a water-catcher is more effective than inflating the vessels: the former completely prevents the flow of liquid, while the latter only reduces the flow. See the note on 25.171–2. Nor is he moved to explain how covering the top of the water-catcher relates to closing a pore. The verb συμμύειν (line 169) may refer to the closing of an opening,¹⁵² and the comparison with the water-catcher suggests that it is the inner opening of the pore which is shut. Nevertheless, Theophrastus does not distinguish between inner and outer opening; in fact, he never explicitly refers to the opening of a pore.¹⁵³ In addition, we are left wondering why inflation of the vessel effects a closing and not dilation of the inner opening.¹⁵⁴

¹⁵¹ See N. Booth, "Empedocles' Account of Breathing," *Journal of Hellenic Studies* 80 (1960): 12–13, to which Bob Sharples has called my attention.

¹⁵² Cf. the Hippocratic *Aphorisms* 5.51: When women are pregnant, "the mouth of the womb closes": τὸ στόμα τῶν ὑστερέων συμμύει.

¹⁵³ Although the comparison with the water-catcher suggests an inner opening, the suggestion may be misleading. Cf. Aristotle, *On the Parts of Animals* 3.5, where the Stagirite speaks of vessels which become progressively narrower until their pores or channels are too narrow for blood to pass through, but not so narrow that the flow of sweat is stopped (668b1–6; see above, the note on 12.77–80). Apparently there is no inner opening (no juncture with an orifice that can be closed), only a progressive narrowing of a continuous vessel.

¹⁵⁴ On dilation of the pores and holding the breath, see the Hippocratic treatise *On Regimen* 2.64, quoted in the note on 1.2–4.

Perhaps Theophrastus has a different idea in mind. For example, he may think that the inflation of vessels causes whole pores (entire passages or at least extended portions of the passages and not just openings) to be squeezed together. That would greatly reduce the flow of moisture, and it is not contradicted by the use of *συμμύειν*, for the verb can be used of extended objects which close in their entirety.¹⁵⁵ Moreover, it may give a more natural reading to lines 170–1, where Theophrastus says that once exertion ceases, the vessels contract and as a result more moisture passes out through pores which are wider and as it were opened up: δι' εὐρυτέρων καθάπερ ἀνεωγμένων. Here the wording suggests to me that entire pores have expanded and become wider.¹⁵⁶ In any case, such an interpretation, makes clear why inflation of the vessels causes the pores to close and not to dilate—the space required for inflation is found by squeezing and thereby narrowing the pores—but whether correct or incorrect, the explanation does not conflict with Theophrastus' primary reason for introducing the water-catcher. He wants to illustrate that the flow of moisture through the pores can be interrupted or greatly diminished and toward that end, comparison with the water-catcher is useful, even if some details may be misleading.

25.174 ὅταν δ' ἀνεθῇ τότ' ἐξέρχεται μηδενὸς ἐμφράττοντος] Codex A does not have ἀνεθῇ. Its reading is ἀναισθητῇ, “lacks perception,” which is unintelligible in this context. Following codices O and B (by the second hand in the margin), I have printed ἀνεθῇ. Since all codices depend on A, ἀνεθῇ has no independent manuscript authority; it has the status of a conjecture and does not resolve all problems. In particular, the subject of the verb is not clear. If we compare 25.167–8 (ὅταν ἀνῶσιν) and *Problems* 2.24 868b28 (ὅταν ἀνεθῇ), the subject appears to be τὸ πνεῦμα.¹⁵⁷ That suggests that Theophrastus has dropped the com-

¹⁵⁵ Theophrastus uses the verb *συμμύειν* in regard to flowers which close at night (*Plant Explanations* 2.19.1, 2.19.3, *Research on Plants* 4.7.8, 4.8.9). We may think of the common tiger lily, which has a tubular or trumpet shaped flower. The flower wraps itself up at dusk, closing from one end to the other, and then opens to its full shape as the sun rises in the morning.

¹⁵⁶ We may compare 22.147–8, where Theophrastus contrasts the pores of persons who take exercise and those who do not. The former have pores which have been opened up, ἀνεωγμένοι, and the latter have pores which have closed, συμμεμυκότες. Apparently, frequent exercise and the repeated flow of moisture through the pores leave the pores expanded or open (from one end to the other); in contrast, failure to exercise allows the pores to contract or close up.

¹⁵⁷ Cf. also 32.205.

parison with the water-catcher and returned to the case at hand: when exertion has ceased and “when (the breath) is released, then (the moisture) passes out, since nothing is in the way.” However, it is also possible to take ἀνεθῆ closely with ἐπιλάβῃ (25.174): a man cuts off the flow of water from the water-catcher by covering the opening at the top with his hand; later when his hand is removed and the opening uncovered, water flows from the instrument. That is the way Burnikel understands the text.¹⁵⁸ The translation which I have printed opposite the text—“when it is released, then (the water) passes out, since nothing is in the way”—is intended to present this interpretation without overtranslating. In particular, the subject of ἀνεθῆ is left unspecified.

Schneider rejects ἀνεθῆ on the grounds that the final genitive absolute becomes unnecessary. But repetition is a feature of this section; see the note on 25.171–2. Nevertheless, the reading ἀνεθῆ is at best probable, so that one is tempted to print the reading of A, ἀναισθητῆ, in *crucēs* and to mention ἀνεθῆ along with other possibilities in the *apparatus criticus*.

26.175–9 ἔπειτα δὲ—ἐκπίπτειν] A second explanation of the phenomenon set forth in 25.166–8 is given in these lines. We may compare *Problems* 2.20 where the same phenomenon is explained in two ways, 868a15–20 and 868a20–5, the two explanations being presented as alternatives: πότερον . . . ἢ.

26.175–7 ἔπειτα δὲ καὶ ἡ ἀπόκρισις ἡ ὑπὸ τῆς θερμότητος γινομένη διὰ τῶν πόρων ἐκ τοῦ ὑγροῦ πνεύματος † ἢ καὶ ἄγει † πρὸς τὸ ἐπιπολῆς] The lemma is the text transmitted in codex A. I have placed *crucēs* around those words, ἢ καὶ ἄγει, which are most likely to be corrupt. Burnikel p. 154 includes more: the first *crux* is placed before ἡ ὑπὸ τῆς θερμότητος and a second after ἢ καὶ ἄγει. That may be overly cautious, for the words prior to ἢ καὶ ἄγει can be read as transmitted. In particular, the genitive πνεύματος goes with ἡ ἀπόκρισις, “the separation of breath.” Cf. the translation of Furlanus (p. 236, as well as Burnikel p. 155) and the parallel text in *Problems* 2.20: ἢ ὅτι πονούντων μὲν ἀποκρίνει ἡ κίνησις ἐκ τοῦ συμπεφυκότος ὑγροῦ πνεύμα, καὶ διὰ θερμότητα τὴν ἀπὸ τῆς κινήσεως γίνεται τὸ ὑγρὸν πνεῦμα ἐπιπολῆς (868a20–2). Nevertheless, the collocation of two genitives, πνεύματος coming immediately after τοῦ ὑγροῦ, creates a certain awkwardness, so

¹⁵⁸ Burnikel translates: “Lässt man aber (die obere Öffnung) frei, dann läuft es aus, da nichts (mehr den Austritt) sperrt” (p. 155).

that it is tempting to follow Schneider vol. 4 p. 791 and Wimmer (both editions), who delete the preposition ἐκ. The deletion is, however, unnecessary and even damaging to the sense: Theophrastus is saying that the breath which arises on account of heat is separated *from* what is moist.

26.177–9 ὅταν δὲ παύσῃται πονῶν ἢ τε θερμότης ἅμα λήγει καὶ ἐκ τοῦ πνεύματος ἀποψυχομένου γίνεται ὑγρότης ὁ καλούμενος ἰδρῶς, ὥστε καὶ πλεῖον καὶ ῥᾶον ἐκπίπτειν] In codex A the opening words of the lemma run as follows: ὅταν δ' ἐπαίσθηται πονῶν ἢ τε θερμότης ἅπασα διίῃ. *Problems* 2.20 868a22–3 has ὅταν δὲ παύσῃται πονῶν, ἅμα καὶ ἢ θερμότης λήγει, which is the basis of the corrections, δὲ παύσῃται and ἅμα λήγει, found in the lemma.¹⁵⁹

The words καὶ ἐκ τοῦ πνεύματος ἀποψυχομένου γίνεται ὑγρότης ὁ καλούμενος ἰδρῶς have a clear relationship to 1.3–4: εἴτ' ἔξω πηγνυται καὶ συνίσταται καταψυχόμενον. In both passages, Theophrastus considers the possibility that sweat occurs when breath is condensed through cooling. In fact, the two explanations given in 25.168–26.179 appear to correspond closely with the two possibilities mentioned in 1.2–4: sweat occurs when moisture is secreted, or when breath is cooled and condensed on the outside, ἔξω. On the latter possibility, see 38.238–40 and the note *ad loc.* The parallel passage in *Problems* 2.20 has both possibilities: moisture passes through the pores (868a15–20) and breath on the surface, ἐπιπολῆς, is thickened and becomes the moisture which is sweat (868a20–5).

Nevertheless, the final words of the lemma, ὥστε καὶ πλεῖον καὶ ῥᾶον ἐκπίπτειν, should not be ignored. They have no parallel in *Problems* 2.20 and are grounds for drawing a distinction between what is said in 1.3–4 and 26.177–9. The subject of the infinitive ἐκπίπτειν is almost certainly moisture or sweat, so that Theophrastus seems to be speaking of sweat

¹⁵⁹ The occurrence of διίῃ in codex A is of some interest. The form, 3rd person singular subjunctive of διέναι (διά + either ιέναι or ιέναι), is certainly wrong; the indicative is wanted. The occurrence of διέντος, the present participle of διέναι (διά + ιέναι) in codex A at 1.3 might suggest emending to διίῃσι. Then Theophrastus would be saying that heat as an efficient cause sends breath or moisture condensed from breath through the pores (cf. 26.175–6). There are, however, reasons for rejecting the emendation. First, at 1.3 the subject of the participle is not heat but breath, and the text has been emended to read διόντος. Second, the emendation does not go far enough. In particular, it leaves unchanged the preceding ἅπασα, which seems odd or at least adds nothing if διίῃσι is read. Third, reading ἅμα λήγει is preferable, for both words occur in the *Problems*, λήγει is used in a similar way in *On Sweat* 29.192 (cessation is followed by sweating), ἅπασα disappears at 26.177, and ἅμα λήγει together give good sense to 26.177–9: when exertion stops, heat ceases at the same time, so that breath is cooled and becomes sweat.

which flows out through the pores rather than sweat which first occurs on the surface. If that is correct, then Theophrastus is indeed speaking of moisture which arises from breath which is cooled, but the transformation takes place within and not on the surface.¹⁶⁰ The idea can be found in the Hippocratic treatise *On Breaths* 8, where the author speaks of breath which strikes the pores, condenses internally and flows out through the pores as sweat.¹⁶¹

The matter may be still more complicated, for *On Sweat* 26 speaks of degrees of sweat: *πλεῖον* and *ῥᾶρον* (line 179).¹⁶² Apparently, sweating is increased when exertion ceases; breath condenses within and then pours out as sweat. That leaves open the possibility—indeed, it implies—that during exertion some sweating does occur. Nevertheless, the idea is not developed in section 26, and the same is true of the parallel portion of *Problems* 2.20. For after telling us that during exertion heat brings breath to the surface (868a20–2, quoted in the note to 26.175), the author of 2.20 immediately connects the occurrence of sweat with the cessation of exertion: ὅταν δὲ παύσῃται πονῶν, ἅμα καὶ ἡ θερμότης λήγει, καὶ ἐκ τοῦ πνεύματος πυκνουμένου ὑγρότης γίνεται, ὃ καλούμενος ἰδρῶς, “When exertion ceases, at the same time heat also abates, and from the breath which becomes thick there develops moisture, which is called sweat” (868a22–5).

27.180–2 μετὰ τοὺς δρόμους καὶ τοὺς πόνους ἐν τῇ σκιᾷ μᾶλλον ἰδροῦσιν ἢ ἐν τῷ ἡλίῳ διὰ τὸ τὸν ἥλιον ἀναξηραίνειν καὶ πυκνοῦν τοὺς πόρους] The lemma contains the first occurrence of ἰδροῦσι(ν) in *On Sweat*. The form ἰδρῶσι(ν) first occurs at 24.163. See the Introduction, Section 1.

Schneider adds supplements as follows: <οἱ> ἐν τῇ σκιᾷ <καθεζόμενοι> μᾶλλον ἰδροῦσιν ἢ <οἱ> ἐν τῷ ἡλίῳ. The addition is based on Photius’ excerpt, where all the supplements are found. Certainly, the emended text is more readable, but the supplements are unnecessary, and in my judgment they do not reflect what Theophrastus wrote. In fact, Photius’ treatment of section 27 is a good example of his readiness to abbreviate, to vary and to enhance. Only the first sentence of the section is excerpted (i.e., the lemma), and the excerpt involves a variation in word order (the phrase

¹⁶⁰ Not all cases of cooling and condensation within result in sweating. See 38.238–40, where we are told that nausea may be the result.

¹⁶¹ See Debru, *Le corps respirant*, p. 187–9 and, “La sueur des corps,” p. 167.

¹⁶² Cf. 25.166.

μετὰ τοὺς δρόμους καὶ τοὺς πόρους becomes μετὰ τοὺς πόρους καὶ τοὺς δρόμους). In addition, definite articles and a participle are added (οἱ . . . καθεζόμενοι . . . οἱ), and the διὰ-clause is replaced by a different construction (διότι + the indicative: διότι ὁ ἥλιος ἀναξηραίνει καὶ πυκνοῖ τοὺς πόρους). The last change is patently an enhancement; Schneider does not suggest that it is reason to emend codex A.

The διὰ-clause with which the lemma ends credits the sun with not only removing but also inhibiting sweat. Drying up, ἀναξηραίνειν, is the removal of surface moisture. That gives the appearance of sweating less, for the moisture evaporates instead of collecting on the surface (cf. 31.200 and the note *ad loc.*). Closing the pores, πυκνοῦν τοὺς πόρους, inhibits sweating, so that men in fact sweat less. The use of the verb πυκνοῦν suggests that the pores are thickened or compacted, but how that happens is not spelled out. Presumably the explanation has nothing to do with restraining the breath, which is said to inhibit sweating by inflating the vessels, which in turn causes the pores to close (25.168–72).¹⁶³

In regard to the sun removing surface moisture, we may compare the Hippocratic treatise *On Airs, Waters and Places* 8. Here we read that a man who walks or sits in the sun while wearing a cloak sweats on the parts of the skin which are covered and not on the parts exposed to the sun, for the sun draws up the sweat as it appears. When the man goes to a shady spot, then he sweats over his entire body. In *On Sweat* 38, sweating under a cloak is mentioned, but from a different point of view: namely, that sweating under a cloak results in lack of color.

27.182–3 οὔτε ὀλίγον] Grangerius prints οὔτ' ὀλίγον thereby removing the hiatus. See the Introduction, Section 1.

28.184 ἰδίσειεν] The lemma is the reading of codex A. It is changed to ἰδρώσειεν in codex R.¹⁶⁴ All editions through that of Schneider have ἰδρώσειεν. In his fifth volume (p. 175), Schneider reported and endorsed the reading of codex A, ἰδίσειεν. Wimmer subsequently printed it in both

¹⁶³ For the phrase πυκνοῦν τοὺς πόρους, cf. Theophrastus, text 345.27–8 FHS&G, where we are told that sprinkling water on those who faint benefits them: it closes the pores and concentrates heat within.

¹⁶⁴ Burnikel p. 71 reports that a second hand in codex D has changed ἰδίσειεν to ἰδρώσειεν. That is not apparent in the photocopy of D which I have inspected. D appears to follow A in exhibiting ἰδίσειεν at 28.184 and ἰδρώσειεν at 28.186. In codex B, which descends from D, ἰδρώσειεν is the reading at both 28.184 and 186. Codex R, which is earlier than B and belongs to a different line of descent, also has ἰδρώσειεν in both places.

of his editions. The verb ἰδίειν does not occur elsewhere in *On Sweat*, but it is found in *Research on Plants* 5.9.8.¹⁶⁵ Most likely ἰδρώσειεν replaced ἰδίσειεν at 28.184, not only because ἰδρωῖν occurs everywhere else in *On Sweat*, but also because the form in question, ἰδρώσειεν, occurs soon thereafter in 28.186. Or did Theophrastus write ἰδίσειεν twice? In any case, ἰδίσειεν is the *lectio difficilior*.¹⁶⁶

28.186 μᾶλλον δὲ] The lemma is the reading of codex A. Codex D has μᾶλλον without δέ, and therefore the other codices dependent on D lack δέ.¹⁶⁷ So do the editions of Grangerius, Furlanus, Heinsius, Schneider and Wimmer. I have printed the reading of A, for it seems possible that δέ may be apodotic, repeating the δέ of the protasis and looking back to what precedes the protasis. See Denniston, *s.v.* δέ II.1.v p. 180–1 and II.4 p. 183–5. See also above, the notes on 1.5–6 and 20.135–6.

28.188 ἐκεῖνο δ' οὐ δύναται τὸ πλεῖον δι' ἀσθένειαν] The reference of ἐκεῖνο is problematic. The translation printed opposite the text presents one possibility: ἐκεῖνο refers to the “initial smaller fire” which is implied, though not explicitly mentioned, in what immediately precedes (28.185–8). The explanatory phrase δι' ἀσθένειαν seems to support this translation, as does *Problems* 2.11 867a36–b2. For there we are told that an initial small fire is effective in preparing the body, but another and larger fire is required for sweat to break out. A different translation is, however, possible. If τὸ πλεῖον is taken with ἐκεῖνο and the latter referred to πολὺ πῦρ in 28.185, then the text says: “but that larger (fire at the outset) is powerless on account of weakness.” This translation is suggested by *Problems* 2.11 867a32–3: τὸ πλεῖον οὐ ποιήσει πλεῖον ἢ μᾶλλον τοῦναντίον, ὅτι τῷ τὸ σύμμετρον εἶναι ἐργάζεται τὸ ἔργον). The larger fire (τὸ πλεῖον) is ineffectual, because being effective requires a proper proportion. If the comparison with 867a32–3 can be pressed, then Schneider's emendation—δι' ἀσυμμετρίαν for δι' ἀσθένειαν—seems especially attractive. Indeed, the emendation seems necessary, if the second translation is preferred, but it is not incompatible with the first inter-

¹⁶⁵ See LSJ *s.v.* ἰδίω, where there is also reference to Aristotle, *HA* 3.19 521a14.

¹⁶⁶ It may appear odd or unbelievably forgetful that Theophrastus would introduce the verb ἰδίειν after having twice used ἰδρωῖν, but we may compare the Hippocratic treatise *On Airs, Waters, Places* 8, where ἰδίει (3rd person sing. of ἰδίειν) is almost certainly the correct reading despite the fact that forms of ἰδρωῖν occur twice in the immediately preceding lines (p. 90.18, 20, 24 Jones).

¹⁶⁷ See the *stemma codicum* of Burnikel p. 90.

pretation. In any case, I have elected to print the text transmitted by codex A and to mention Schneider's emendation in a note to the translation.

29.189 τὰὐτὸ δὲ πὼς τοῖς διηρημένοις] Here Theophrastus refers back to section 25, where he had discussed a similar topic: sweating less while exerting oneself than after stopping (25); sweating less while running than after stopping (29). The latter phenomenon is said to be "in a way the same" as the former. We may wonder why the two topics are not discussed one after the other, but in fact sections 25–9 form a loose unity. Sections 25–6, 27 and 29 all concern sweating after exercise; section 28 is a kind of footnote or extended comment on 27. Moreover, in the later sections of *On Sweat* Theophrastus is concerned primarily with individual phenomena; overall organization is of lesser importance.

29.190–1 ἢ τε τοῦ πνεύματος κάθεξις καὶ ἡ τοῦ ἀέρος κίνησις κωλύει] As at 25.166–72, so here restraining the breath is said to prevent sweating; but see 33.212–13 and 34.216–18 together with the note *ad* 33.212–13.

The phrase "the movement of air" seems to have been deliberately chosen, for here Theophrastus focuses on running, in which case the movement of air over the body is primarily self-generated. Strictly speaking, it is not wind. Of course, men do run on windy days, but they also run on calm days, when the movement of air depends entirely on the act of running. Exactly how the movement of air prevents sweating is not stated, but remarks elsewhere concerning wind are suggestive. At 31.200 breath or wind is said to have a drying effect. That suggests evaporation, so that sweat never collects on the surface of the body. At 38.236 wind is said to have a cooling effect, so that sweat never reaches the surface. The latter may be thought to suit section 29 better, for here the movement of air is mentioned alongside restraining the breath. According to 25.169–70, restraining the breath inflates the veins which closes the pores. That prevents moisture from reaching the surface of the body.

29.191–2 ποιεῖ μὲν γὰρ οἶον * * * μὲν αὐτὸς αὐτῷ. παυσάμενον δὲ καὶ στάντος ἀμφοτέρω λήγει καὶ οὐδὲν κωλύει] The words of the lemma are the reading of codex A. They are omitted in codex D, and as a result they are not found elsewhere in the manuscript tradition.¹⁶⁸ The first edition to print the words is that of Wimmer (1862), who

¹⁶⁸ See Burnikel p. 67 with the *stemma codicum* on p. 90.

on page xxvi refers to Schneider, vol. 5 p. 175, where the reading of codex A is reported. Schneider observes that the words were lost through homœoteleuton (κωλύει in lines 191 and 192) and that the pseudo-Aristotelian *Problems* 2.24 is of no help in filling the lacuna. Taking a cue from the letters μον, he suggests supplying ἐμφοραγμὸν or ἀποφοραγμὸν.¹⁶⁹

30.193 τὰ δ' ὑπὸ τοῦ ὕδατος κάτω φερόμενα μέρη τοῦ σώματος] In his excerpt, Photius 278 529a31–2 replaces these words with τοὺς πόδας οἱ τῷ ὕδατι ἐμβάλλοντες. Burnikel suggests the following. Photius made his excerpt from a manuscript in which κάτω and φερόμενα were reversed.¹⁷⁰ He read τὰ δ' ὑπὸ τοῦ ὕδατος φερόμενα κάτω μέρη τοῦ σώματος and replaced “the parts below” with a specific reference to feet. Originally κάτω will have been a marginal gloss, which appears in codex A in a mistaken position. Words occurring at 35.222, τοὺς πόδας καὶ τὰς κνήμας [ἴν'] ἐν τῷ ὕδατι ἔχουσιν, prompted the gloss and stand behind the rendering of Photius.

That is an intriguing suggestion, but Burnikel offers a second and in my judgment far more likely explanation. It is that Photius read the words of A, found them difficult and sought to clarify the text by drawing on 35.222. He narrowed a general discussion about parts of the body to one about feet and subsequently passed over section 35, which is about feet and shins.

30.193–4 οὐ διῷδρῶσιν] The verb διῷδρῶσιν occurs nowhere else in Theophrastus. Photius 278 529a32 has ἰδροῦσι. Schneider prints ἰδρῶσιν and is followed by Wimmer. Burnikel approves the correction and suggests that οὐ διῷδρῶσιν arose from οὐδ' ἰδρῶσιν. He also argues that διῷδρῶσιν does not fit the context: since liquefaction does not occur, it is not a case of failing to sweat out or through because sweat is held back at the surface; rather it is a case of not sweating at all. That may be true, but I am not convinced that such a fine distinction should govern emendations in a treatise that is note-like and often unpolished.¹⁷¹ Moreover, any time men sweat (in the every day sense of the word), they sweat through (the pores)—ἰδρῶσιν implies διῷδρῶσιν.¹⁷² Hence, I am inclined to leave the text as we find it in A, and to believe that Photius replaced the longer and

¹⁶⁹ In LSJ there is no entry for ἀποφοραγμός, but ἀποφράγνυμι, ἀπόφραξις and ἀποφράσσω are all listed.

¹⁷⁰ Burnikel p. 135–6.

¹⁷¹ For a different case of acceptable imprecision, cf. 7.44, 46 and above *ad loc.*

¹⁷² Cf. 25.172, where διῷέναι occurs. Schneider and Wimmer unnecessarily change the verb to ἐξίέναι.

more descriptive term with one which is shorter and commoner. Indeed, the change is only one of several which Photius introduced. See the preceding note on 30.193.

It might be objected that the corresponding passage in the *Problems* agrees with Photius in exhibiting the simple verb without prefix—the passage begins διὰ τί οὐχ ἰδρουῦσι τὰ ἐν θερμῷ ὕδατι μέρη, οὐδ' ἂν θερμά ῃ; (2.2 868b15–16) and that in such cases the agreement is compelling, so that ἰδρῶσιν should be read at *On Sweat* 30.194. But the matter is not so simple, for the relevant sentence in the *Problems* does not follow *On Sweat* closely. Most obvious is the explicit mention of heat: “in hot water” and “hot” parts of the body. My guess is that the compiler of the *Problems* not only introduced this double reference to heat but also changed the verb of the sentence, dropping the prefix in favor of the simpler form.

30.194–6 ὁ δὲ ἰδρῶς τῇξίς τίς ἐστὶν οἶον τῶν κακῶς προσωκοδομημένων ταῖς σαρκὶν ὅταν ἐκκρίνηται διὰ τὸ θερμόν] Here Theophrastus tells us that “sweat is a certain liquefaction, as of badly made additions to the flesh, when (the additions) are secreted on account of heat.” Cf. 11.75–6, where Theophrastus says that sweat which comes from deeper within is heavier “as when there is colliquescence of the flesh”: ὥσπερ συντηκομένης τῆς σαρκός.

The subject of ἐκκρίνηται is not altogether clear. It may be “additions,” picking up τῶν κακῶς προσωκοδομημένων, but we can also understand “sweat” from ὁ . . . ἰδρῶς, or moisture from τῇξίς τίς. In any case, the general idea is not in doubt: badly made additions normally (i.e., when the relevant parts of the body are not submerged in water) become moisture through liquefaction and are then secreted as sweat through the skin. Theophrastus is thinking in terms of the first possibility set forth in section 1: sweat occurs “straightway with moisture when it is secreted” (1.2).

The participle προσωκοδομημένων introduces a striking metaphor from the activity of the builder: what has been badly built on, or built as an addition to the flesh is liquefied and secreted. The preceding οἶον seems intended to apologize for the boldness of the metaphor; cf. the use of οἶον at 2.11 and of καθάπερ at 2.15 and 25.170–1. For Theophrastus’ interest in the “apologetic” metaphor, see Philodemus, *De rhetorica* 4 = 689A FHS&G and Cicero, *To Friends* 16.17.1 = 689B FHS&G.

On the relationship between προσωκοδομημένων and the text at 2.7–8, see the note *ad loc.*

31.197 διαλιπόντες] Grangerius, followed by Furlanus and Heinsius, changed διαπαλαίοντες, the manuscript reading, to διαλείποντες. Schneider made the change to διαλιπόντες. The aorist participle seems preferable, for pausing in the middle of a workout is prior to sweating in greater quantity once the workout is resumed.¹⁷³ The present participle in line 198, διαπαυομένων, correctly reflects the fact that moisture collects during a pause.

In sections 25–7 and 29, Theophrastus considers the case of sweating more once exertion has ceased. Now in section 31 we have the case of sweating more after a pause and during resumed activity. That may seem inconsistent, but perhaps the explanation is that section 31 deals with cases in which there is little moisture present when a workout is interrupted. During the pause moisture accumulates, but bodily heat diminishes. When the workout resumes, heat increases and the body sweats profusely.

31.200 καθάπερ ὁ ἥλιος καὶ τὰ πνεύματα] The drying effect of the sun has already been mentioned at 27.181.

In *On Sweat*, πνεῦμα most often means “breath,” either inhaled breath or vaporized moisture within the body. Here, however, πνεῦμα refers to wind, as it does again at 38.236.

Having said that continuous exercise dries up moisture: ἡ δὲ συνεχὴς ἀναξηραίνει (31.199–200), Theophrastus refers by way of explanation to the sun and the wind. Both may inhibit sweating as well as dry up surface moisture (see the notes on 27.181–2 and 29.190–1). Since Theophrastus introduces the sun and the wind for the sake of comparison (καθάπερ), he would seem to have something else in mind. But what?¹⁷⁴ The mention of the sun suggests that Theophrastus is thinking of heat. We may compare 37.233, where the heat of the body is said to come to the surface and dry (ξηραίνει) the moisture on the face. The mention of wind is more puzzling, but perhaps Theophrastus is thinking of the movement of air over the body, which may occur during exercise even on a windless day. That would fit the case of running, with which the section begins, but it ill suits the case of wrestling, which is mentioned in the very same line (31.197).

¹⁷³ Cf. the use of the aorist participle in the parallel text *Probl.* 2.7 867a8: ἐὰν διαπαυσάμενοι παλαίωσι. The present participle might be used for the imperfect, suggesting repeated action, i.e., repeated pauses which build up more moisture than a single pause. But nothing in section 31 (clearly) supports the idea.

¹⁷⁴ It is unlikely to be restraining the breath, for that has an inhibiting (25.168–72, 29.190–1) and not a drying effect: ἀναξηραίνει, 31.200.

For despite considerable exertion on the part of wrestlers, the motion of their bodies is neither continuous nor fast enough to create the flow of air necessary for drying the surface of the body.

32.201 τὸ ὀπισθεν] All editions read τὰ ὀπισθεν, but codex A has the singular. In regard to content there is little to choose between. The immediately following plural, τῶν ἔμπροσθεν, appears to speak for τὰ ὀπισθεν, but τὸ ὀπισθεν can be taken inclusively in much the same way that “the back,” τὸ νῶτος, covers distinguishable parts.¹⁷⁵ Moreover, *Problems* 2.14, which deals with the same question as our section 32, mixes singular and plural without causing confusion. There the author first opposes the back, τὸν νῶτον, to the front parts, τὰ πρόσθεν (867b12), and then makes both singular, τῷ πρόσθεν and τῷ ὀπισθεν (867b13–14). I have, therefore, printed the singular, seeing no compelling reason to depart from codex A; cf. τὸ ἄνω at 35.224 and the note *ad loc.*

32.201 καί(τοι)] Codex A has καὶ, which is possible: two apparently incompatible assertions are joined without emphasis. Nevertheless, editors beginning with Grangerius have felt the need to highlight the apparent incompatibility. Grangerius printed εἰ καὶ and Furlanus, followed by Schneider, καίτοι. Also possible is καίπερ. Cf. 18.121, where καίπερ is an emendation. I have hesitatingly followed Furlanus and printed καί(τοι).

32.201–2 ἡ θερμότης καὶ ἡ ὑγρότης πλείων ἐν τοῖς ἔμπροσθεν] Although *Problems* 2.14 begins with the same question as section 32 of *On Sweat*, it appears to contradict the statement of the lemma in regard to both heat and moisture. In regard to heat, we are told that the back is more retentive of sweat than the front, because the front is cooled more (867b18–19).¹⁷⁶ In regard to moisture, we are told that the back is fleshier and therefore moister than the front, and that the marrow in the spine provides much moisture (867b21–4). These contradictions, together with the fact that none of the explanations offered in 2.14 appears in section 32, should give us pause concerning the relationship between the two texts. See the next note.

¹⁷⁵ For the singular in Theophrastus’ botanical treatises, see *Research on Plants* 2.3.3 and *Plant Explanations* 5.2.2.

¹⁷⁶ Presumably the cooling is thought of as continuous, so that the front is normally cooler and given to sweating less. That would not rule out exceptional periods in which cooling fails (perhaps artificially caused), so that the front is hotter and sweats more.

32.202 ἔμπροσθεν * * * ὅτι] After ἔμπροσθεν and before ὅτι, codex A has a short dash. That may indicate the omission of a transitional phrase between the statement of the problem and the beginning of the solution: e.g., 24.163 suggests supplying a phrase like τρόπον τινὰ φανερόν. Such an omission need not be the result of confusion; rather it may be stylistic, as is the case several times in *On Fatigue* (10, 11, 16 and cf. 15). Nevertheless, here at *On Sweat* 32.202, the omission is likely to be more serious; and in marking a lacuna, I am following Schneider, vol. 2 p. 614 and vol. 5 p. lix, who suggests that the solution to the problem stated in lines 201–2 has fallen out along with the statement of the problem discussed in lines 202–6. The missing solution may have resembled that put forward in *Problems* 2.14, but there are reasons to think otherwise. See the preceding note. The missing problem may have concerned the upper body (cf. lines 203–4). Schneider cites *Problems* 2.4 866b28: διὰ τί τὰ ἄνω ἰδροῦσι μᾶλλον τῶν κάτω. That question has already been raised at *On Sweat* 24.163, but the answer put forward (24.163–5) is so brief and so general, that Theophrastus may have thought it useful to return to the problem.¹⁷⁷ I am, therefore, inclined to believe that Theophrastus is discussing upper body sweat in 32.202–6, though the exact formulation of the problem remains problematic.

32.202–3 διὰ τε τὴν πάλην καὶ τὴν τρίψιν] Here in section 32, τρίψις is translated “rubbing”; in section 34, the cognate verb τρίβειν is rendered with “to rub.” That is consistent and safe; but in combination with πάλην, as in the lemma, τρίψις might be translated by “massage,” for it appears to refer to the rubbing of the body before or after wrestling.¹⁷⁸

32.203 ἥττον κωλύεται] The subject is almost certainly “sweating”: it is prevented less on account of wrestling. The comparative adverb, ἥττον, is significant: the stoppage is not complete. We may compare 25.166, where we are told that men sweat more, μᾶλλον, when they stop exerting themselves. While exerting themselves they sweat, but they sweat more once exertion ceases. Cf. the note on 32.204: ὅτι ὅπου πόνος ἐνταῦθα καὶ ἰδρώς.

32.203–5 ἡ διάστασις . . . ἡ διάστασις τοῦ πνεύματος] There are two occurrences of ἡ διάστασις in close proximity. Grangerius trans-

¹⁷⁷ I owe the observation to Bob Sharples.

¹⁷⁸ Cf. the Hippocratic treatise *On Regimen* 2.64, where πάλην and τρίψις occur together.

lates the first “humoris stillatio” (fol. 25^v); but he omits the second, in fact the entire last sentence of section 32, from his text and therefore from his translation. Furlanus prints the full text, twice emending to ἡ διάτασις. He translates only the second occurrence: “spiritus intensio” (p. 237). Wimmer adopts the emended text and translates “extensio . . . extensio spiritus” (p. 407–8). Given the apparent lacuna in line 221 and the resulting lack of context (it is unclear what question is being answered), certainty seems out of reach. I have preferred to print the text of codex A and to translate “expansion (of the breath) . . . expansion of the breath,”¹⁷⁹ for that seems to fit the references to wrestling and rubbing (line 203) and generally to exertion (line 204). When men exert themselves, they inhale and hold the breath (cf. 25.166–7), and that results in expansion of the breath within the body. Initially that inhibits sweating, but when the breath is released it drives out sweat in greater quantity (lines 204–6). Nevertheless, διάστασις may refer to separation and not to expansion;¹⁸⁰ and if that is the case here, Theophrastus might be saying that the separation of breath from the upper parts is greater (lines 204–5)¹⁸¹ and that the separation of breath has the effect of driving out more sweat, once the breath is released (line 205–6).

32.204 ἄνω μᾶλλον] I have printed the text of Grangerius. Schneider, vol. 5 p. 175, reports ἄν βάλων as the reading of codex A. Nevertheless, ἄνω (*re vera* ἄνω) μάλων is almost certainly the reading of the codex. The letters β and μ resemble each other closely, but comparison with other occurrences of initial β (e.g., 5.33, 7.44, 11.75 twice) speak against βάλων. In addition, codex D, which is closest to A, exhibits ἄνω μάλων.

32.204 ὅπου δὲ πόνος ἐνταῦθα καὶ ἰδρώς] The lemma involves an emendation, ὅπου δὲ, by Lapini. Codex A has ὅτι οὐδὲ.¹⁸² If we follow codex A, Theophrastus would be denying the presence of exertion and sweat. In this context, that would be odd. The reference to wrestling and massage points to the occurrence of exertion, and the use of comparative adverbs in lines 203 and 205–6 makes clear that some sweat is followed by a greater amount of sweat.

¹⁷⁹ See LSJ s.v. I.f, citing Philo Mechanicus, *Belopoeica* 77.23.

¹⁸⁰ See LSJ s.v. I.a and Theophrastus, *On Fatigue* 10 (separation of what is continuous: thigh and sinew) and *On Dizziness* 12 (separation of what is present).

¹⁸¹ Cf. 175–6: ἡ ἀπόκρισις . . . πνεύματος.

¹⁸² Lapini suggest that pi was misread as tau-iota: Π→ΤΙ.

32.205 ἐξωθεῖ] The verb invites comparison with the Hippocratic treatise *On Regimen* 2.64, where we are told that holding the breath can drive out moisture from the skin: ἐξῶσαι δύνάται.¹⁸³ But there is a difference between *On Sweat* 32 and *On Regimen* 2.64. In *On Sweat*, sweating profusely is said to occur when the breath is released (ὅταν ἀνεθῇ, line 205; cf. 25.167–8). In *On Regimen*, there is no reference to releasing the breath. Rather, the clear suggestion is that the breath, when being held, exerts a force which drives out moisture.

32.206 πλεῖον καὶ ἀθροτέρως] Cf. 26.179.

33.207, 211 μάλιστ’] See the Introduction, Section 1.

33.208–10 μανότητος . . . ἡ τριχῶν ἔκφυσις . . . ἀποδηλοῦσαι] Similar wording is used to express the same idea (the growth of hair reveals rarity in texture) at 9.54–5.

33.209 ὁ ἐγκέφαλος] See the note on 3.18–19, 21.

33.211 ἰδρῶσι] The lemma is the reading of codex A; an emendation occurs above the line. See the note on 34.214.

33.212–13 ἔτι δ’ ἡ τοῦ πνεύματος κάθεξις διατείνεται πως εἰς τὴν κεφαλὴν] In his edition, Schneider prints these words as the first sentence of section 34. In vol. 2 p. 614, he suggests that the sentence is a remnant of a different problem. Perhaps it is a remnant; at least it does not seem to be the first sentence of section 34, for that section begins as one expects with the statement of a problem (lines 214–15).

There is, however, reason to think that the sentence is not a remnant, but rather the conclusion of section 33.¹⁸⁴ Theophrastus wants to explain the

¹⁸³ More of the Greek text is quoted in the note on 1.2–4.

¹⁸⁴ If Photius’ excerpt can be taken as a guide, the sentence is the conclusion of section 33. For Photius reproduces the sentence almost verbatim (there is minor variation in word order), but he replaces the initial ἔτι δὲ with καὶ διότι (529a40, following the text of Henry, though one manuscript omits καὶ). That makes the connection to what precedes clearer, for καὶ picks up the preceding καὶ (529a38) and introduces a final explanation (restraining the breath) parallel to the explanation which precedes (rarity of the skin). Nevertheless, the value of Photius’ excerpt is problematic; in what follows, I offer a further reason for thinking that the Theophrastean sentence is not a remnant of a different problem.

fact that men sweat especially on the face, although the face has less flesh and exerts itself least. He says that the head is moist and rare, and refers to the brain and the growth of hairs as proof of moisture and rarity. He then says that for this reason men sweat first and especially on the brow. That may look like the conclusion of the section, but Theophrastus has not explained what triggers sweat on the brow, i.e., why the brow or face which is normally dry sometimes sweats profusely. That explanation may be contained in the disputed sentence beginning ἔτι δ'¹⁸⁵: "Moreover, restraining the breath extends in a way to the head." During exertion the breath is restrained (cf. 26.166–9, 34.217–18); when that restraint extends to the head, profuse sweating occurs. It may be objected that restraining the breath has been said to prevent sweating (25.167–8, 29.190–1). In particular, restraining the breath is said to fill the vessels, so that it prevents (the moisture) from going through: ἡ κάθεξις δὲ τοῦ πνεύματος πληροῖ τὰς φλέβας ὥστε κωλύει διιέναι (25.71–2); the vessels being inflated with breath are said to cause the pores to close up: ὑπὸ τοῦ πνεύματος αἱ φλέβεις ἐμθυσώμεναι συμμύειν ποιοῦσι τοὺς πόρους (25.168–70). That is indeed what is said in earlier passages, but in what follows restraining the breath is treated as a cause of profuse sweating (34.216, 220–1). Perhaps Theophrastus is now thinking in terms of the Hippocratic treatise *On Regimen* 2.64, where we are told that restraining the breath can force open the pores, thin the skin and drive out sweat.¹⁸⁶

Concerning the effect of restraining the breath, *On Sweat* appears inconsistent (sections 25 and 29 versus sections 33 and 34). I do not think that the appearance can be denied, but we may still ask whether the inconsistency is only apparent. In particular, could Theophrastus have removed the inconsistency by introducing additional considerations like different degrees of exertion, the condition of the hypodermic flesh and the tension of different muscles within the body?¹⁸⁷ I am inclined to answer in the affirmative and to take note of the fact that *On Sweat* is not a polished treatise, especially the second half (sections 24–40). It gives the impression of rough lecture notes, which invite fuller discussion during lecture.

¹⁸⁵ On ἔτι δέ, see the note *ad* 23.161–2.

¹⁸⁶ *On Regimen* 2.64: πνεύματος δὲ κατάσχεσις τοὺς πόρους διαναγκάσαι καὶ τὸ δέρμα λεπτύναι καὶ τὸ ὑγρὸν ἐκ τοῦ δέρματος ἐξῶσαι δύναται (p. 356.18–20 Jones).

¹⁸⁷ Cf. Debru, *Le corps respirant*, p. 246–8 and, "La sueur des corps," p. 169–70, who aptly refers to Galen, *Hygiene* 3.2–3.

34.214 μάλισθ' ἰδρῶσιν] On both words, see the Introduction, Section 1.

The reading of codex A is ἰδρῶσιν, but above the line a second hand has emended ῶ to οῦ: i.e., ἰδρῶσιν is changed to ἰδροῦσιν.¹⁸⁸ The reason for the change to ἰδροῦσιν may be consistency, for ἰδροῦσιν occurs in line 217. Were that the whole story, I might be inclined to print the emendation in line 214 and thereby gain consistency within section 34.¹⁸⁹ But there are further considerations. In particular, both ἰδρῶσι and ἰδροῦσι occur repeatedly in codex A, so that there is no strong statistical reason to prefer one form over the other.¹⁹⁰ In addition, codex A exhibits the same emendation at the end of section 33 in line 211. Printing the emendation there would introduce inconsistency, for ἰδρῶσιν occurs at the beginning of the section in line 207. My guess is that the emendation in section 34 came first. It was introduced for the sake of consistency within section 34. After that, the emendation was introduced into section 33; that resulted in inconsistency within section 33, and no further changes were attempted. Be that as it may, in the case of ἰδρῶσι and ἰδροῦσι, it seems best to print what was originally written in codex A, and to report emendations *supra lineam* in the *apparatus criticus*.

34.214–15 ἂν τᾶλλα ὁμοιοσχημονῶσιν, κατὰ συμβεβηκός πως τὴν αἰτίαν ληπτέον] The lemma is the reading found in the Aldine and all subsequent editions. In codex A, the words are divided differently and take the form of a question: ἂν τᾶλλα ὁμοιοσχημονῶσι κατὰ συμβεβηκός: πῶς τὴν αἰτίαν ληπτέον; Two dots (like an English colon) occur between κατὰ συμβεβηκός and πῶς.¹⁹¹ The absence of movable nu (ν) on the end of ὁμοιοσχημονῶσι suits this division.¹⁹² We might translate (going back to the beginning of section 34): “Rubbing the arms men sweat

¹⁸⁸ I have accepted the judgment of Burnikel p. xxxi that the emendations in the text of A are by a second hand. Burnikel’s knowledge of codex A is superior to mine. I note only that the corrections in 33.211 and 34.214 (= f. 112^r v. 31 and f. 112^v v. 3) involve an abbreviation of ου, which is exhibited elsewhere in the text of *On Sweat* (e.g., f. 112^v v. 8 and v. 29 and f. 113^r v. 7). To my eye, there is no significant difference either in ink or in form. (In the text of A, the upper half of the abbreviation is wider than the lower half; in the two corrections *supra lineam*, the upper half is also wider, albeit less so.)

¹⁸⁹ I would also be following other manuscripts, beginning with D (the oldest of the manuscripts dependent on A), which exhibit ἰδροῦσιν at 34.214.

¹⁹⁰ See the Index of Important Words, s.v. ἰδροῦν.

¹⁹¹ In codex D, a single raised dot (the Greek colon) replaces the two dots of codex A.

¹⁹² Moveable nu first appears in codex B, where the division of words is the same as in codex A.

most if they happen to maintain the same position with the other (parts of the body). How is one to grasp the explanation?" Since codex A is fundamental to the textual tradition, it may seem prudent to print the text of the codex and to report that of the editions in the *apparatus criticus*. Nevertheless, I have decided otherwise.¹⁹³ For the rhythm of the sentence supports placing a comma after ὁμοιοσχημονῶσιν, and the occurrence of γὰρ in the next sentence suggests that what precedes is a statement and not a question.¹⁹⁴ Moreover, the explanation which follows may be characterized as κατὰ συμβεβηκός πως, "in a way *per accidens*."¹⁹⁵ The phenomenon under consideration is sweating profusely while rubbing the arms, but the primary explanation is not in terms of rubbing the arms; it is in terms of restraining the breath and exerting oneself (34.216–18).¹⁹⁶ Theophrastus is thinking of a gymnastic exercise in which motion is restricted to the arms. Keeping the other parts of the body immobile requires exertion—typically, tensing the body while holding the breath—and should the arm motion be vigorous, maintaining immobility will result in considerable exertion and profuse sweating. It would, of course, be a mistake to say that rubbing the arms plays no role in causing sweat. For when an arm is rubbed, the motion and pressure cause colliquescence and fatigue,¹⁹⁷ and as a result sweat may occur. But to explain the profuse sweating which results from the exercise under discussion other factors are decisive: namely maintaining the same position while restraining the breath with exertion.

I have said that Theophrastus is thinking of a gymnastic exercise. But what is this exercise? A definite answer is elusive, for we are given almost

¹⁹³ The fact that codex A exhibits a circumflex over omega in πῶς at 34.215 is of little significance. The accents in codices are often wrong, and codex A is no exception. In fact, at 33.212, codex A exhibits πῶς, where πως is clearly correct.

¹⁹⁴ Bob Sharples has pointed out to me that γὰρ can be used elliptically and therefore can follow a question as well as a statement. That is correct, but the connection between sentences in lines 215–16 is more readily intelligible if a statement precedes γὰρ.

¹⁹⁵ The parallel passage at *Problems* 2.5 866b33–4 omits the words κατὰ συμβεβηκός πως (πῶς), perhaps because the author was not certain how to construe them.

¹⁹⁶ As in section 33, so here restraining the breath is recognized as a cause of sweating. On exertion as a cause of sweat, see 2.12 and 22.152. Theophrastus' remarks on restraining the breath are difficult to reconcile, for in sections 25 and 29 restraining the breath is said to hinder sweating (and cf. section 32.204–6). It may be that Theophrastus adopts different theories concerning the breath in different sections of *On Sweat*. That seems especially possible in the second half of the treatise (sections 24–40), which is a loosely organized collection of problems. In any case, sections 33 and 34 do associate restraining the breath with sweating. Theophrastus may be adopting a view found in the Hippocratic treatise *On Regimen* 2.64. See the notes on 1.2–4, 2.12–13 and 33.212–13.

¹⁹⁷ Cf. Theophrastus, *On Fatigue* 1 and 3.

no details. In fact nothing is said which clearly decides between an exercise engaged in by a single person and one in which partners take exercise together. In regard to the first possibility, we may think of an individual who rubs together his own arms and does so vigorously while keeping his trunk and legs in one position. That would require exertion and cause sweating. We may compare *On Fatigue* 13, where Theophrastus tells us that it is more fatiguing to engage in a throwing exercise with an empty hand than with a stone or some other weight. Apparently, the presence of a weight in the hand provides the thrower with support. When such support is missing, the exercise is more fatiguing, for the thrower must exert himself—tensing his body and holding his breath—in order to maintain his balance. The application to *On Sweat* 34 is straightforward: straining to maintain the same position while rubbing the arms is fatiguing and a cause of profuse sweating.

Alternatively, we may want to think of the way in which wrestlers and boxers initially engage each other. The former grab a wrist, pull on an elbow and counter the moves of the opponent by blocking with the forearm. The latter keep their hands raised, issue short jabs and progressively attempt to deliver a solid blow across or through the opponent's arms. In both cases, there is contact and considerable rubbing of the arms. Of course, in live wrestling and boxing, the opponents often move in circles, duck and generally change their stance to avoid presenting a stationary target; when that happens, they do not “maintain the same position” with the rest the body (or even a similar position: ὁμοιοσχμονῶσιν).¹⁹⁸ However, if Theophrastus is discussing an exercise involving two persons, it is unlikely that he is thinking of live combat. Rather he is thinking of an exercise in which the participants practice grabbing or jabbing or both, as pankratiasts would, while keeping their trunk and legs largely immobile. Or he may be thinking generally of several different exercises, each of which involves rubbing, requires exertion and causes sweating. The latter possibility could account for the fact that Theophrastus names no specific exercise, and gives no details which enable us to identify an exercise with

¹⁹⁸ In some contexts, it may be important to distinguish sharply between maintaining the same position and maintaining a similar position, but that is not the case here. A person moving his arms vigorously will not maintain exactly the same position with the rest of his body over a long period of time. Nevertheless, he may do so for short periods and with effort his position may differ little over a long period. We may compare *On Fatigue* 14–15, where Theophrastus first speaks of “maintaining the same position,” τὸ ἐν αὐτῷ σχήματι, and then varies his expression with “similarity of position,” ἡ ὁμοιότης τοῦ σχήματος.

certainly.¹⁹⁹ But imprecision is a feature of *On Sweat*; and here in section 34, Theophrastus is not interested in the specifics of one or more exercises. That is the province of the trainer. What does interest Theophrastus is why profuse sweating follows rubbing. Given this interest, the account offered—albeit concise—is sufficient to make clear that the fundamental cause is the exertion involved in restraining the breath and keeping the body tense.

34.216–17 ἰσχύουσι γὰρ μάλιστα τῷ τόπῳ· τὸ γὰρ πνεῦμα οὕτῳ κατέχουσι τὸ ἐγγυτάτῳ ἰσχύοντες] The lemma is the reading of codex A. An interesting emendation is found in the margin of codex B: in the first sentence, τόπῳ (34.216) is replaced by πόνῳ. That would give the sentence the following meaning: “For men are most strong through exertion.” The emendation has some attraction, in that it gives a specific sense to οὕτῳ, “thus,” in the sentence which follows: “for they restrain the breath thus,” i.e., through exertion. But the emendation has not been adopted, for the preceding definite article, τῷ, seems to suit τόπῳ better than πόνῳ, and the phrase τῷ τόπῳ (*re vera* τούτῳ τῷ τόπῳ) is found in the parallel passage at *Problems* 2.5 866b35–6: ἢ δίοτι ἰσχύομεν μάλιστα τούτῳ τῷ τόπῳ· τούτῳ γὰρ τὸ πνεῦμα κατέχομεν τῷ ἔγγιστα τοῦ ἰσχύοντος.

On the basis of *Problems* 2.5, Grangerius emends the text of *On Sweat* as follows: he supplies τούτῳ before τῷ τόπῳ; and he changes οὕτῳ to τούτῳ and τὸ ἐγγυτάτῳ to τῷ ἐγγυτάτῳ. That gives the following text: ἰσχύουσι γὰρ μάλιστα τούτῳ τῷ τόπῳ· τὸ γὰρ πνεῦμα τούτῳ κατέχουσι, τῷ ἐγγυτάτῳ ἰσχύοντες. We may translate: “Men are most strong in this region. For they restrain the breath in this (region), being strong in what is nearest.”²⁰⁰ Supplying τούτῳ before τῷ τόπῳ has not been accepted by later editors; and rightly so, I think, for it is primarily an enhancement which does not improve the intelligibility of the text. The other changes

¹⁹⁹ Grangerius f. 28^r suggests that section 34 concerns the ἀκροχειρισμός; see also Furlanus p. 254 and Flashar p. 425–6. The word ἀκροχειρισμός calls attention to the hand as against the arm (χείρ used inclusively for the entire arm; see LSJ s.v. I.2). According to E. N. Gardiner, “The Pankration and Wrestling,” *The Journal of Hellenic Studies* 26 (1906): 13–15, the ἀκροχειρισμός has nothing to do with wrestling. It concerns boxing and the pankration, and is properly used of practice as against actual competition. For other views, see C. Waldstein in the *Proceedings of the Cambridge Philological Society*, Lent Term (1882): 2–3 and E. Reisch, “Ἀκροχειρισμός,” *RE* I (1894): col. 1198.

²⁰⁰ Grangerius f. 26^r translates: “etenim partis illius robore plurimum valent: quippe cum inde comparato subsidio animam contineant, ab ea parte quae proxima est virium firmitatem obtinentes.”

have, however, found favor, having been printed by Furlanus and then taken further by Schneider, who prints a text which is even closer to the *Problems* than that of Grangerius: τούτῳ . . . τῷ ἐγγυτάτῳ (τοῦ) ἰσχύοντος, “in this (region) . . . which is nearest to what is strong.” The same text is printed by Wimmer in both his editions. The attraction of these changes lies primarily in removing the vagueness of οὕτῳ by reading τούτῳ, but lack of precision is not uncommon in *On Sweat*, and what follows, i.e., τὸ ἐγγυτάτῳ ἰσχύοντες, cannot be said to require emendation. τὸ ἐγγυτάτῳ is an accusative of respect with ἰσχύοντες: men are said to be strong in what is nearest, i.e., in the heart. I have therefore printed the text of codex A and reported the emendations in the *apparatus criticus*.

In an article preliminary to this edition of *On Sweat*, I erred in saying that “what is nearest” (34.217) refers to the arms.²⁰¹ I was following Flashar’s translation of τῷ ἐγγίστα τοῦ ἰσχύοντος (*Problems* 866b36): “da sie (die Gegend) unserem stärksten körperteil (den Armen) am meisten benachbart ist” (p. 25). At the time, the translation struck me as faulty, for the superlative “stärksten” is an overtranslation (ἰσχύοντος is not superlative) and I added a note that effect.²⁰² What I did not say, and should have, is that the translation introduces a factual error: the arms are not a man’s strongest bodily part, even in a well-trained athlete. The legs are far stronger. How, then should we interpret the phrase “what is nearest”? And how should we construe the preceding reference to the region in which men are most strong: ἰσχύουσι . . . μάλιστα τῷ τόπῳ (34.216)? We can, I think, say that the region in which men are most strong is indeed the region of the arms, but we must add that the strength in question is not that of the upper limbs. Rather it is the internal strength of breath, the lungs and the heart. With that in mind, I think it useful to compare Aristotle, *On Sleep and Waking* 2, for here Aristotle recognizes three regions of the body (τριῶν διωρισμένων τόπων 456a3), of which the middle is the part about the heart (τὸ περὶ τὴν καρδίαν μέρος a5). The middle region is where breathing originates (ἢ τοῦ πνεύματος ἀρχὴ . . . ἐνταῦθα a8–9), and it is by holding the breath that men gain strength (ἰσχὺν δὲ ποιεῖ ἢ τοῦ πνεύματος κάθεξις a16–17). The application to our Theophrastean text is, I think, straightforward. In line 216, τόπος refers to the middle region, where

²⁰¹ Fortenbaugh p. 102.

²⁰² *Ibid.* p. 102 n. 24.

breathing occurs (the *τόπος ἀναπνευστικός* or *πνευματικός*²⁰³), and in line 217, *τὸ ἐγγυτάτω* refers to the heart, which is nearest to the lungs.

In discussing 25.167, I have already considered the possibility that Theophrastus adopted the Aristotelian doctrine of connate breath and applied it to the process whereby breath is restrained. Here I add only that the doctrine may be especially suited to 34.216–17; for if *Movement of Animals* 10 is a guide, connate breath is not only a fundamental source of strength (703a10, 19) but also concentrated in the heart (703a14). That fits well with our interpretation of the Theophrastean phrase “strong in what is nearest,” i.e., in the heart. But we should not forget that our passage, like the rest of *On Sweat*, makes no explicit mention of connate breath, and the breath which is said to be restrained is the breath inhaled from outside.

34.218–19 εἶτα καὶ χειρὶ τριβομένων συμπονοῦμεν μᾶλλον ἢ] The words εἶτα καὶ seem to introduce a new perspective: we move from rubbing to being rubbed, and the third person plural is replaced by the first person plural. In *Problems* 2.5, the first person plural is used throughout, both before and after εἶτα καὶ (867a1). That is almost certainly attributable to the author of 2.5, who saw no reason for a shift in person. Indeed, there is no obvious reason, and in *On Sweat*, the shift to the first person plural is especially problematic, for it occurs nowhere else in the treatise. Perhaps its occurrence in section 34 marks a late and awkward addition to the text.

The words χειρὶ τριβομένων συμπονοῦμεν μᾶλλον ἢ constitute an emended text printed by Grangerius. Codex A has χειρὶ τριβομένων συμπονούμενοι ἄλλων. The last three words of Grangerius’ text reproduce what is found in *Problems* 2.5 867a1: τῇ τριβομένῃ συμπονοῦμεν μᾶλλον ἢ.²⁰⁴ Schneider prints a text which is even closer to that of the *Problems*: τῇ χειρὶ τριβομένῃ συμπονοῦμεν μᾶλλον ἢ. The same text is printed by Wimmer. It is certainly true that the reading of codex A is corrupt, and that the last two words, συμπονούμενοι ἄλλων, are plausibly emended on the basis of *Problems* 2.5. However, the first two words, χειρὶ τριβομένων, are not obviously corrupt, and it is not a serious objection to Grangerius’ text that it begins with a genitive absolute whose subject is

²⁰³ Theophrastus uses the phrase ὁ ἀναπνευστικός τόπος in *On Sweat* 38.240. The phrase ὁ πνευματικός τόπος occurs in *On Fainting*, text 345.32–3 FHS&G and *On Fatigue* 12.

²⁰⁴ In the Loeb edition of the *Problems* (London: Heinemann 1936) vol. 1 p. 48, W. S. Hett supplies χεῖρι after τῇ τριβομένῃ. He justifies the supplement on the grounds that *On Sweat* 34 is the source of *Problems* 2.5.

unexpressed and identical with that of the main verb. Such a construction may be unusual, but for that reason it can be emphatic.²⁰⁵

More worrisome may be the use of *χειρὶ*. Out of context, *χειρὶ* might refer to the hand, as against the arm; and the hand in question might be that of a masseur and not one's own or that of an opponent or exercise partner. That would involve a sudden shift, but the second half of section 34 involves an unmistakable shift—from the third person plural to the first—and that shift might coincide with a shift in focus, especially if the second half of section 34 was originally independent of what precedes. Nevertheless, both the immediately following reference to exertion and the reference to restraining the breath in lines 219–20 suggest that there is no shift in focus: section 34 continues to discuss one or more exercises in which individuals bring their own arms into contact, or partners engage with the arms and in doing so are rubbed as well as rub.²⁰⁶ That can be made clearer by adopting the emendation of Schneider, *τῇ χειρὶ τριβομένη*,²⁰⁷ and for some that may be a decisive reason to reject the reading of codex A. I have, however, resisted the change and prefer to credit the author of *Problems* 2.5 with clarifying the idea presented in *On Sweat* 34.

34.220–1 καὶ γυμναζόμεθα καὶ τρίβοντες μᾶλλον ἰδροῦμεν] After the initial καὶ and before γυμναζόμεθα, Grangerius supplied τριβόμενοι. He is followed by Schneider and Wimmer, but not by Furlanus. The supplement agrees with the text of *Problems* 2.5 867a3 where τριβόμενοι is found: καὶ τριβόμενοι γυμναζόμεθα καὶ τρίβοντες. However, the supplement does not bring the two texts into full agreement: μᾶλλον ἰδροῦμεν does not occur in the *Problems*. There the καὶ–καὶ construction governs two participles; in *On Sweat* as read in codex A, καὶ–καὶ governs two finite verbs. Most likely the author of *Problems* 2.5 has altered the text of *On Sweat* not only by dropping μᾶλλον ἰδροῦμεν but also by adding τριβόμενοι. Moreover, supplying τριβόμενοι in *On Sweat* is

²⁰⁵ On the use of the genitive absolute for emphasis, see Kühner-Gerth II.2 p. 110. For other Theophrastean examples, in *On Sweat* and elsewhere, see the note on 1.2–4.

²⁰⁶ I do not want to deny that some massages can be strenuous for the person being massaged, especially if the masseur lifts the arms into the air and works on them with vigor. In such a case, the person being massaged may be forced to hold his breath and tense the rest of his body, and as a result, he may sweat. But in the text of *On Sweat* 34, there is little to indicate that such a massage is under discussion. For an ancient (2nd c. A.D.) discussion of different kinds of massage, see Galen, *Hygiene* 2.2–4.

²⁰⁷ The emendation makes clear that *χειρὶ* does not refer to the hand of a masseur. The reference is to the arm of the person being rubbed. But the emendation in itself does not make clear who does the rubbing: oneself, an exercise partner, or a masseur.

unnecessary. The Theophrastean text is often elliptical, and if Theophrastus is discussing a gymnastic exercise in which the participant or participants rub arms together, rubbing is always being rubbed.

34.220–35.223 καὶ τρίβοντες μᾶλλον ἰδροῦμεν. καὶ ὅταν τοὺς πόδας καὶ τὰς κνήμας [ἴν'] ἐν τῷ ὕδατι ἔχωσιν † ἢ ὅταν τὸ ἄλλο σχῆμα † διὰ τε τὰ προειρημένα] Except for the signs indicating deletion and corruption, the lemma is the reading of codex A. Forster suggests ending section 34 with τρίβοντες. He puts a period after τρίβοντες and inserts δὲ after μᾶλλον. In section 35, he would change ἔχωσιν to ἔχωμεν. Those changes render intelligible ἢ ὅταν in line 223, but they introduce into section 35 the use of the first person plural. In codex A the usage is confined to the second half of section 34. Moreover, the changes do not help with σχῆμα, which Forster, following Wimmer (who is following Schneider and Furlanus), would emend to σῶμα.

Grangerius and Furlanus do not introduce changes into the end of section 34. Instead they emend section 35 by supplying ἦττον ἰδροῦσι(v Furl.) before ἢ ὅταν in line 223. The verb ἔχωσιν is left unchanged, i.e., it does not become first person plural. Furlanus, but not Grangerius, emends σχῆμα to read σῶμα.

The occurrence of ἴν' in 35.222 may be a simple error attributable to the immediately following ἐν. Perhaps the scribe first wrote ἴν' and then straightway corrected himself, writing ἐν, but failing to erase ἴν'. We cannot, however, rule out a different possibility. It may be that ἴν' originally introduced a dependent clause which was preceded by words now lost.

The phrase διὰ τε τὰ προειρημένα, "on account of what has been said previously," is almost certainly a reference to 30.193–4, where Theophrastus says, "Men do not sweat on the parts of the body borne down below the water." If we apply that statement to our lemma, we can say that the feet and the shins, when immersed in water, do not sweat, so that any mention of degrees of sweating (e.g., if we supply ἦττον ἰδροῦσι with Grangerius), must refer to sweating through bodily parts above the feet and shins. Such parts would seem to be referred to by τὸ ἄνω in line 224 (see the note on this line); the words διαθερμαινομένων τούτων, which precede, would refer to feet and shins. But even if that is correct, we do not have a full and certain interpretation of the passage. In any case, it seems clear that section 35 might be better placed immediately after section 30. Perhaps it is a latter addition to the series of problems beginning in section 24; again, there is no certainty.

35.224 τὸ ἄνω] The lemma is the reading of codex A. Grangerius makes the article plural and reads τὰ ἄνω; cf. 32.203–4: ἐκ τῶν ἄνω.²⁰⁸ The plural is more common, and in section 35 it would be entirely appropriate, for the section begins by mentioning two lower parts, feet and shins (line 222), and these same parts seem to be the subject of the genitive absolute which immediately precedes τὸ ἄνω (line 224). Nevertheless, the emendation is not necessary, for τὸ ἄνω can be used collectively of upper parts (cf. its use in *Research on Plants* 4.10.3 and 7.2.8²⁰⁹). Furthermore, if we emend the text at 223 to read τὸ ἄλλο σῶμα, then we have a collective singular which might encourage Theophrastus to write τὸ ἄνω. For these reasons, I have printed the manuscript reading and recorded Grangerius' emendation in the *apparatus criticus*.²¹⁰ See the note on 32.201: τὸ ὀπισθεν.

35.225 ὅπου θερμὸν καὶ ὑγρόν] Cf. 18.121–2, 23.160–1, 24.163–5, 40.249–50.

36.226–7 ἄτοπον δ' ὅτι οἱ ἀγωνιῶντες τοὺς πόδας ἰδρῶσι, τὸ δὲ πρόσωπον οὐ. καίτοι μᾶλλον εὖλογον τὸ μάλισθ' ἰδρωτικὸν καὶ μὴ τὸ ἥκιστα] With these words, Theophrastus begins a discussion of why men who are anxious sweat on the feet and not on the face. It is the only discussion in *On Sweat*, in which a particular emotional condition is explicitly related to sweating. In section 33, Theophrastus has already discussed the fact that men sweat especially on the face: τὸ δὲ πρόσωπον μάλιστ' ἰδρῶσιν (line 207). Now in section 36, Theophrastus discusses an exception which is called “odd,” ἄτοπον. This discussion might be better placed immediately after section 33, but the latter half of *On Sweat* is not marked by careful organization.

On the form μάλισθ' (line 227), which avoids hiatus, see the Introduction, Section 1.

The final words of the lemma, καὶ μὴ τὸ ἥκιστα, are printed by Schneider and subsequently by Wimmer in both his editions. Codex A has τὸ before μὴ. Burnikel p. 29 n. 25 says that the Aldine edition exhibits μὴ

²⁰⁸ At 24.163 τὰ is a supplement.

²⁰⁹ In 4.10.3 the head of the water-lily is called τὸ ἄνω, after which parts of the head like petals, sepals and seeds are mentioned. In 7.2.8 the many stems and branches of dill and coriander are contrasted with the single main root and few side roots of the same plants. The contrast is expressed collectively by opposing τὸ ἄνω to τὸ κάτω.

²¹⁰ For another case in which I resist making a singular into a plural, see 18.122 and the note on 121–2.

before τὸ. That is puzzling, for the microprint of the Aldine which I have inspected clearly shows τὸ before μῆ.

36.228–9 οὐ μετάστασις θερμότητος ὥσπερ ἐν τοῖς φόβοις] Here anxiety is differentiated from fright. In the latter, but not in the former, there is removal of heat. Theophrastus does not tell us how we are to conceive of this removal. Most likely he is not suggesting a general cooling of the body, but rather a transference of heat within. We may compare Aristotle, *On Respiration* 20 479b22–4, where we are told that the upper parts of frightened men become cold; the hot matter retreats below, and being concentrated it produces palpitation. Also relevant are *Problems* 2.26–7 and 2.31, both of which have clear connections with *On Sweat* 36.²¹¹ In the former, fright is said to involve the removal of heat from the upper to the lower parts of the body (869a2–3). In the latter, fright is described as the cooling of the upper parts (869b7–8).

Problems 2.26–7 and 2.31 involve two different conceptions of anxiety. In 2.26–7 the author follows Theophrastus closely, saying that anxiety is not a removal of heat as in fright but an increase as in anger. The increase causes the face to become red, dries the moisture on the face and causes sweating on the feet (869a2–5, 8–12).²¹² In 2.31 the author (probably a different author) treats anxiety as a kind of fear involving a cooling of the upper body, loss of color in the face and movement of the feet. The movement is likened to exercise, connected with stress and recognized as the cause of sweating on the feet (869b6–11, 17–19). As presented, the contrast is clear, so that one can say that 2.26 is in line with Theophrastus, and 2.31 is not. For the latter advances a conception of anxiety which is rejected in *On Sweat* 36. Nevertheless, *Problems* 2.31 contains a difficulty: after characterizing anxiety as a kind of fright, the author tells us that anxious men are eager for the task, because heat has collected in the region of the chest: ὀρμητικοὶ γάρ εἰσι πρὸς τὸ ἔργον διὰ το θερμὸν αὐτῶν ἡθροῖσθαι εἰς τὸν περὶ τὸ στῆθος τόπον (869b13–14). The problem here is that being eager for the task seems incompatible with fright, which nor-

²¹¹ Both *Problems* 2.26 and 2.31 begin with the same question expressed in identical words: διὰ τί οἱ ἀγωνιῶντες ἰδρῶσι τοὺς πόδας, τὸ δὲ πρόσωπον οὐ, “Why do men who are anxious sweat on the feet and not on the face?” (868b34–5 and 869b4–5) Aside from minor variation in wording, that is same question with which Theophrastus begins Chapter 36. On two different sections in the *Problems* drawing on the same passage in *On Sweat*, see the Introduction, Section 3.

²¹² It is clear that *Problems* 2.26 should be read in connection with 2.27. The latter draws on *On Sweat* 37. See Flashar p. 431.

mally manifests itself in avoidance.²¹³ Apparently, the author of 2.31 has slid from anxiety as a kind of fear to anxiety as an emotional condition which actually prepares one to meet a challenge: the kind of anxiety which athletes feel even when they are confident and eager—we can say “anxious”—to get on with the competition.²¹⁴ That would seem to be the kind of anxiety which is under discussion both in 2.26 and in *On Sweat* 36. It fits well with dissociating anxiety from fright and comparing it with anger. For anger, or more generally strong spirit (θυμός), often makes one eager to confront another and to redress an apparent wrong.

36.230–1 ὁ θυμός ζέσις τοῦ περὶ καρδίαν θερμοῦ] The lemma is the reading of codex A. Schneider, following *Problems* 2.26 869a5–6, supplies τὴν before καρδίαν. Wimmer prints Schneider’s supplement in both his editions. The supplement may improve the style of the definition, but such an enhancement is uncalled for in a treatise whose style is frequently wanting.²¹⁵ Furthermore, τὴν is omitted from the definition found in Aristotle’s *On the Soul* 1.1: ζέσιν τοῦ περὶ καρδίαν αἵματος καὶ θερμοῦ (403a31–b1).²¹⁶

In an article on a rhetorical fragment of Theophrastus, 712 FHS&G, Elisabetta Matelli p. 63 points out a connection between our passage and Galen, *On the Doctrines of Plato and Hippocrates* 6.8.74 (p. 422.28–30 De Lacy). There Galen quotes Plato’s *Timaeus* 70B, “so that when the strength of anger boils,” and then tells us that “the philosophers after him (Plato) even made this a definition of anger, saying that it (anger) is a boil-

²¹³ It might be suggested that the anxious man, like the frightened man, is eager to seek safety. But that is not the most obvious meaning of the words in question. Indeed, the author has already used ἔργον of the task which confronts the anxious man and which is the object of his anxiety (869b6–7). If ἔργον has the same meaning later (at 869b13), as it surely does, the author is saying that the anxious individual is eager to take on the task confronting him.

²¹⁴ Cf. Aristotle, *Rhetoric* 1.9 1367a15: καὶ περὶ ὧν ἀγωνιώσι μὴ φοβούμενοι, “Those things, also, are noble for which men strive anxiously, without feeling fear.” The translation is that of Roberts (1924) and seems to me preferable to that of Kennedy (1991): “(Those things are honorable) also for which people contend without fear.” For the latter treats ἀγωνιᾶν strictly as a verb of action, whereas here it seems to convey the idea of a positive emotional response and therefore a response quite different from that of fright.

²¹⁵ The author of *Problems* 2.26 not only adds τὴν before καρδίαν but also moves θερμοῦ forward, adding τοῦ. In addition, he supplies the verb ἐστὶ. The result is a fuller and perhaps more attractive definition—ὁ θυμός ζέσις τοῦ θερμοῦ ἐστὶ τοῦ περὶ τὴν καρδίαν—but that is not reason to expand the definition as given in codex A.

²¹⁶ In Aristotle, mention is made of blood as well as heat. No one suggests inserting a reference to blood in the Theophrastean definition.

ing of the heat in the heart.”²¹⁷ Matelli comments that Theophrastus is to be counted among “the philosophers after him,” i.e., after Plato. That is correct,²¹⁸ providing we understand that for Theophrastus, as for Aristotle, a full definition of anger specifies not only a change in the condition of the body but also the cause and goal of anger.²¹⁹ I.e., a full definition mentions the thought of outrage as the cause of anger and revenge as the goal.²²⁰

36.231–2 ἀλλὰ † τὸ μὲν οὐ διὰ τὸ, τὸ μὲν πρὸς ὃ ατο † μᾶλλον θερμαίνεσθαι] The lemma is the reading of codex A. Corruption is obvious. The most plausible emendations are those of Schneider and Forster, both of whom suppose that the corruption has been caused by homœoteleuton. In his edition of the text, Schneider prints ἀλλὰ διὰ τὸ μᾶλλον ἐκθερμαίνεσθαι. διὸ τὸ μὲν πρόσωπον ἐξέρυθροι γίνονται καὶ οὐχ ἰδροῦσι διὰ τὸ μᾶλλον ἐκθερμαίνεσθαι. The words διὸ—ἐκθερμαίνεσθαι are taken verbatim from Photius 278 529b3–4. Forster’s emendation is similar. It is based on *Problems* 2.27 869a8–9 and differs only in conjunctions and particles, and in the choice of θερμαίνεσθαι (cod. A and *Probl.*) over ἐκθερμαίνεσθαι (Phot.).²²¹ In volumes 2 and 5, Schneider decides against printing the second half of Photius’ compound sentence: καὶ—ἐκθερμαίνεσθαι. Schneider’s second thoughts may be correct, but once we accept the fact that Photius has what is missing, there is little reason to break off the supplement at mid-point. Selecting half the material does make the distance between τὸ μὲν and τὸ δ’ (37.223) shorter, but the longer text is still quite readable.

²¹⁷ In Greek the definition runs: ζέσιν εἶναι . . . αὐτὸν (i.e., θυμόν) τοῦ κατὰ τὴν καρδίαν θερμοῦ.

²¹⁸ I am not endorsing everything Matelli asserts. In particular, I have considerable doubts about her claim that Theophrastus anticipated the Stoic notion of psychic tension, τόνος τῆς ψυχῆς (p. 63–7).

²¹⁹ Cf. Aristotle, *On the Soul* 1.1 403a27.

²²⁰ See “Theophrastus on Emotion,” in *Theophrastus of Eresus: On his Life and Works*, ed. W. Fortenbaugh, P. Huby and A. Long = Rutgers University Studies in Classical Humanities 2 (New Brunswick: Transaction 1985), 209–12.

²²¹ Within a discussion of the iteration of a compound verb in a succeeding clause or sentence by the simple verb, Renchan p. 81 cites *On Sweat* 36.231–2 and argues that *Problems* 2.26 869a7 should read ἐκθερμαίνεσθαι and 2.27 869a9 θερμαίνεσθαι. His argument is interesting, but it is based on Wimmer’s text of *On Sweat* 36, and that text reproduces the conjecture of Schneider, ἐκθερμαίνεσθαι, at 36.232. In fact, codex A has θερμαίνεσθαι (here the reading is not in doubt), and *Problems* 2.26 869a7 has διὰ τὸ μέλλον. Only Photius has ἐκθερμαίνεσθαι.

37.233 ξηραίνει γὰρ ἡ θερμότης ἐπιπολάζουσα] Grangerius and all subsequent editors supply τὸ ἐν τῷ προσώπῳ ὑγρὸν after ἐπιπολάζουσα. The words are found in *Problems* 2.27 869a9–10—τὸ μὲν ἐν τῷ προσώπῳ ὑγρὸν—and may have occurred in *On Sweat*. We should, however, notice that the supplement, as found in the several editions, involves dropping μὲν and a change in word order: in the *Problems* the words come before ξηραίνει. Moreover, the supplement has no parallel in Photius 278 529b4–5. Since the text of Theophrastus, like that of Photius, is intelligible without addition, I prefer to confine the supplement to the *apparatus criticus*.

38.236–7 ἔνιοι δ' ἰδροῦντες (ναυτιῶσιν) ἂν ψυχθῶσιν ἢ πνεύματι ἢ ὕδατι. συμβαίνει γὰρ ναυτιᾶν οὐκ ἀλόγως] Codex A has ἔνιοι δ' ἰδροῦσιν ἂν ψυχθῶσιν ἢ πνεύματι ἢ ὕδατι. συμβαίνει γὰρ ναυτιᾶν οὐκ ἀλόγως. These words can be translated—"Some men sweat if they are cooled either by wind/breath or water. For it happens not unreasonably that they become nauseous"—but the opening portion is undoubtedly faulty. *Problems* 2.18 868a5–6 has the following: διὰ τί οἱ ἰδροῦντες ἂν ψυχθῶσιν ἢ ὕδατι ἢ πνεύματι ναυτιῶσιν. That suggests an emendation like that of Grangerius, printed in the text and above in the lemma.

The πνεῦμα and ὕδωρ referred to in the lemma are not to be confused with the πνεῦμα and ὑγρὸν mentioned in the immediately following lines 38.237–9. In the lemma, Theophrastus refers to wind and water (Grangerius translates “ventus” and “aqua”) which are external to the body and capable of cooling it. In what follows, he refers to breath and moisture (“spiritus” and “humor”) which are within the body and capable of causing nausea when cooled and contained. The distinction is made clear by the shift from ὕδωρ to ὑγρὸν and by the use of ἴδιον to qualify πνεῦμα.

38.238–40 τὸ πνεῦμα, τὸ ἴδιον καὶ ἔξω γινόμενον ἰδρώς, τοῦτο ψυχθὲν καὶ ὑγρὸν γενόμενον] Beginning with Furlanus, editors have changed ἴδιον to διὸν. The change is suggested by *Problems* 2.18 868a7–8: καὶ τὸ πνεῦμα διὸν ἔξω γινόμενον ἰδρώς. If the author of the *Problems* is following the text of *On Sweat*, it may be that he misunderstands it, for Theophrastus appears to have used ἴδιον in order to emphasize that the πνεῦμα in question is the breath proper to a person and not the external air or wind that works a cooling effect.

Both ἰδρώς and τοῦτο are emendations. Codex A has ἰδρώτων τὸ. Emending ἰδρώτων to ἰδρώς is suggested by *Problems* 2.18 868a8. Per-

haps τοῦτο was shortened to τὸ, when ἰδρώς was lengthened to ἰδρώτων.²²²

It sometimes happens that breath passes through the skin, cools and condenses, and becomes sweat on the outside, i.e., on the surface of the body. See the notes on 1.2–4 and 26.177–9. Such cases of external cooling are not to be confused with the cooling referred to in the words τοῦτο ψυχθὲν. Here Theophrastus refers to breath being cooled *within*, before it passes through the skin. The parallel passage in *Problems* 2.18 868a8–9 is fuller and clearer: τοῦτο (sc. πνεῦμα) ἔσω ψυχθὲν πρὶν ἐξελθεῖν.

38.240 τῷ ἀναπνευστικῷ τόπῳ] Cf. text 345.2–3 FHS&G, where fainting is explained by reference to cooling in the region where breathing occurs: ἡ λειποψυχία στέρησις ἢ κατάψυξις τοῦ θερμοῦ περὶ τὸν ἀναπνευστικὸν τόπον. For discussion see the commentary of Sharples *ad loc.*

39.241–2 οἱ δ' ἐν ἱματίῳ δρόμοι καὶ ἰδρώτες καὶ (ἐλαίου ἀλεί)ψεις εἰς ἱμάτιον ἀχρόους ποιοῦσι] Grammatically there are three subjects, but Theophrastus is concerned with two phenomena: 1) running while wearing a cloak causes paleness, and 2) oil on the skin underneath a cloak has the same effect.²²³ The first case is an exercise discussed in the Hippocratic treatise *On Regimen* 2.63. There we are told that running in a cloak heats the bodies more rapidly and makes them more moist than other running exercises, but it also causes bodies to have less color, for the cleansing effect of pure air striking the body is absent: θάσσον δὲ διαθερμαίνοντες ὑγρότερα τὰ σώματα ποιέουσιν, ἀχροώτερα δέ, διότι οὐκ ἀποκαθαίρει προσπίπτον τὸ πνεῦμα τὸ εἰλικρινές. In the second case, anointing with oil underneath a cloak, running is not necessary for the effect, though presumably it would speed up the process. As with running in a cloak, the proximate cause is a stifling or lack of ventilation which causes paleness.

Instead of ἀχρόους, Schneider and Wimmer in both his editions print the contracted form ἄχρους.²²⁴ I have chosen to follow Grangerius and

²²² Several codices, the earliest of which is z = no. 23 Burnikel, omit the words ἰδρώτων—γενόμενον. Furlanus and Heinsius also omit these words, as does Grangerius, only in his text ὕδωρ follows γινόμενον. I.e., he prints τὸ πνεῦμα τὸ ἴδιον καὶ ἔξω γινόμενον ὕδωρ.

²²³ The opening sentence of *Problems* 38.3 is clearer: διὰ τί οἱ μὲν ἐν ἱματίῳ δρόμοι καὶ ἡ τοῦ ἐλαίου εἰς ἱμάτιον χρῆσις ἄχρους ποιεῖ, . . . ; (966b34–5).

²²⁴ Furlanus, too, prints a contracted form, but in his case, it is εὔχρους and not ἄχρους.

print the uncontracted form ἀχρόους, which is closer to the reading of codex A, ἀθρόους (an error which may have been caused by the occurrence of ἀθρόον in the immediately preceding section, 38.238). It is also consistent with εὔχροοι, printed at 39.246.

39.243 διὰ τὴν κατάπνιξιν] Here κατάπνιξις, smothering, is mentioned as the cause of paleness. At 9.58–9 it is referred to as a cause of bad odor.

39.246 εὔχροοι] Codex A has εὔχροιοι, which is printed by Furlanus. Following Grangerius, I have printed εὔχροοι. Schneider and Wimmer print εὔχροιαν as part of a more invasive emendation: the subsequent γὰρ is moved, and καὶ is dropped. See the *apparatus criticus*.

39.247 συνισταμένας] The reading of codex A, συνεσταλμένας, is corrupt. συνεσταμένας, found in codex B, is the simplest emendation, but the perfect middle/passive is rare. συνισταμένας occurs in the Aldine and all subsequent editions. It also occurs in the parallel passage at Problems 38.3 967a3. The verb, συνίστασθαι, without corruption, occurs at 1.4: συνίσταται.

40.248–9 ἐν δὲ τοις ὕπνοις οἱ ἰδρῶτες μᾶλλον ἢ ἐγρηγόροσιν ὅτι καὶ ὑγρότατα καὶ θερμότατα πάντα διὰ τὴν ἀντιπερίστασιν] The same phenomenon—men sweating more when asleep than awake—is discussed in *Problems* 2.28 869a13–18, where two answers are given. First, the origin of sweat is within, and the parts within are hotter, so that the internal heat causes melting and secretes the internal moisture. Second, although something is always flowing from the body, it is not noticed, for there is no place on which it may fall. The second answer is essentially a redescription of the phenomenon. It is not the case that men sweat more when asleep; rather, they are lying on bedclothes or the like which capture and make evident what the body secretes. The first answer seems closer to what Theophrastus has in mind: during sleep, cold concentrates heat within, and this concentration results in sweating. On the concentration of heat, compare the Hippocratic treatise *Epidemics* and Aristotle's *On Sleep and Waking*. In the former, we read that when one is awake the exterior of the body is hotter and the interior colder, and when one is asleep the opposite is true (6.4.12).²²⁵ In the latter, we are told that

²²⁵ See also 6.5.15, where the author says that during sleep blood retreats more within the body. For commentary see Manetti and Roselli p. 92–3 and Langholf p. 90–1.

sleep is a certain coming together of the hot matter and a natural concentration (ἀντιπερίστασις) on account of the causes stated (3 457b1–2). The causes referred to are the physiological changes which occur after eating: hot matter is carried upward to the region of the brain which is cold; it is stopped there and subsequently descends in a mass; the result is sleep (456b17–28, 457b20–6).

In section 23, there is also mention of ἀντιπερίστασις: concentration of heat within caused by the cold weather of winter. See the note on 23.159–60.

40.249–50 ἐξ ἀμφοῖν δὲ τούτοις] Cf. 18.121–2, 23.160–1 and 35.225.

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INDEX OF IMPORTANT WORDS OCCURRING IN *ON SWEAT*

(References are to sections and lines of the Greek text.)

- ἄγαν**] excessively (exerting oneself) 17.118; too (much heat) 27.182; too (close to the fire) 28.184
- ἄγειν**] to bring (to the surface ?) 26.176
- ἄγρυπνεῖν**] to go sleepless (results in ease of sweating) 20.138
- ἀγύμναστος**] non-exerciser (in bad condition sweats easily) 21.142
- ἄγωνία**] anxiety (causes sweating of the feet) 36.228
- ἄγωνιᾶν**] to be anxious 36.226, 231
- ἀεὶ**] always, at every moment (urine accumulating) 2.14; (sweat being secreted, οὐκ) 2.14; (the body steaming) 2.15; (ventilation being continuous) 19.130; (having a quantity of residue) 22.154; always, whenever it occurs, on each occasion (secretion in accordance with bodily condition) 12.82; (a quantity of residue being present) 15.101; (removing what is proportionate) 22.152
- ἀήρ**] air (prevents sweating) 29.191; (cools) 39.246
- ἄθροος**] brought together (of moisture within the body) 38.238; (adv. comp.) 32.206
- αἷμα**] blood (sweat resembles) 12.76; (unconcocted) 12.79
- αἴσθησις**] perception (of breath which is imperceptible) 2.15
- αἰτία**] cause 5.29, 33; 6.36; 18.122; 22.150; 25.168; explanation 23.158; 34.215
- αἴτιον**] cause 11.73; 15.101; explanation 8.47; 36.228
- ἀκαθαρσία**] impurity (of the stomach) 5.32; (of the body) 13.84
- ἀκόλουθος**] in conformity with 5.29
- ἀλειπτήριον**] sudatory (where one stands near a fire) 28.185
- ἄλειψις**] anointing (with oil inside a cloak) 39.241
- ἀληθής**] true; (neut.) 12.81; 23.159
- ἀλλοίωσις**] alteration (of the body) 10.66; 11.72
- ἄλλότριον**] foreign (to the nature of flesh) 2.7; 4.26
- ἄλμυρίς**] salty fluid (from sweat) 16.109
- ἄλμυρός**] salty (sweat) 1.5; 2.7; 3.16; 4.23; (saliva and tears) 3.22; (bodily juices) 13.87; τὸ ἄλμυρόν] what is salty 4.25
- ἄλόγως**] unreasonably (not) 38.237
- ἄλυκός**] salty (comp., sweat) 4.24; (juice) 16.112
- ἄλυσιτελής**] useless (of what is secreted) 4.25
- ἀναδιδόναι**] to give off (an odor) 10.62
- ἀναξηραίνειν**] to dry up (of the sun) 27.181; (of external heat) 27.183; (of continuous exercise) 31.200
- ἀναπνεύστικος**] for breathing (of a region in the body) 38.240

- ἀναφέρειν]** to carry up (pass., of residue) 20.137
ἀναχρωννύναι] to color (slightly) (pass., of moisture) 12.79
ἀνήρ] man (as distinct from child) 18.120
ἀνιέναι] to release (the breath) 25.168; (pass.) 32.205; (pass., the opening of the water-catcher) 25.174
ἀνοιγνύναι] to open (pass., of the pores) 21.145; 22.147–8; 25.171
ἄνοιξις] opening (of the pores) 8.48
ἀνόμοιος] dissimilar (condition of sweat) 11.72; (cause) 11.73
ἄνοσμος] lacking in odor (of sweat) 5.30
ἀντικαθιστάναι] to effect a settling down (of eruptions) 14.93
ἀντιπερίστασις] concentration (of heat) 23.160; 40.249
ἀντισπᾶν] to cause diversion (revulsion) 14.93
ἄνω] up, above; **οἱ ἄνω τόποι]** the regions (of the body) above 20.137; **τὸ τὰ ἄνω]** the upper (part[s] of the body) 24.163; 32.204; 35.224
ἄοσμος] lacking odor (of sweat) 9.53
ἄπεπτος] unconcocted (salty secretion) 3.16; (cold sweat) 10.64; (moisture from veins) 12.78; (blood) 12.80; (juice) 14.91; (food) 20.138; 21.143
ἀπέρασις] carrying off (of moisture) 19.132
ἀπερίττωτος] without residue (of an aged body) 8.52
ἀπεψία] lack of concoction (connected with bad odor) 5.32 (twice); 9.60; (connected with cold sweat) 10.64
ἀπλῶς] generally (on account of) 2.13; (the case) 12.80
ἀποδηλοῦν] to reveal (moisture and rarity) 33.210
ἀποδιδόναι] to assign (the cause) 6.36
ἀποκαθιστάναι] to restore; (second aor.) to settle down (of eruptions) 16.106–7
ἀπόκρισις] separation (occurring on account of heat) 26.175
ἀποψύχειν] to cool; (pass., breath) 26.178
ἄπτεσθαι] to be connected (with absence of concoction) 5.31
ἄρχειν] to begin (middle, of sweat) 11.70
ἄσαρκος] without flesh; (comp., of the face) 33.207
ἀσθένεια] weakness (of fire) 28.188
ἀτμίζειν] to steam (of the body) 2.15
ἄτοπος] odd 7.41; 21.141, 144; 36.226
αὔξησις] growth (of the body) 7.45; 19.125; increase (in heat) 36.229
αὐτομάτως] automatically (of the accumulation of urine) 2.11; (of sweating by men in bad condition) 22.153
ἀφαιρεῖν] to remove (moisture as sweat) 22.153
ἄφαντος] invisible (of the secretion of breath) 2.15
ἀφίδρωσις] sweating-off (results in ease of sweating) 22.147
ἀφροδισιάζειν] to engage in sexual activity (frequency results in a bad condition of the body) 6.39–40

- ἀφροδίσιον]** (pl.) sexual activity 8.47
ἀπεψία] absence of concoction (results in malodorous sweat) 5.32; (caused by a bad bodily condition) 5.32
ἄχροια] lack of color (of the body) 39.243, 244
ἄχροος] characterized by lack of color 39.242

βάθος] depth (of the body) 11.75
βαρύς] heavy (odor) 6.38; (comp., sweat) 11.75
βαρύτης] heaviness (of odor) 7.44
βρῶμα] food (pl., those which produce foul odors) 5.33

γένος] genus; (dat.) generically 5.31
γέρων] aged man 7.44, 46; 8.50; 19.127
γλυκύς] sweet (superl., of what is consumed) 2.8; (of what is concocted) 3.16
γυμνάζειν] (middle) to exercise 6.37; 21.141-2, 144; 31.197; (pass.) 34.220
γυμναστής] trainer (Diotimus) 11.69
γυμνός] naked (running) 39.245

δάκρυον] tears (compared with sweat) 3.17; (salty) 3.22
δεῖ] it is needed, necessary (that moisture be present) 19.128; (that there be neither too much nor too little heat) 27.183; (corrupt passage) 14.93
διαίρειν] to distinguish; (pass.) 29.189
δηλον] (it is) clear, clearly (of an explanation) 11.72; 12.77
δηλοῦν] to make clear (that the head breathes well) 9.54
διαθερμαίνειν] to heat through; (pass., of parts of the body) 35.224
διάθεσις] condition (of sweat) 11.73
διαίρειν] to distinguish; (pass) 29.189
διαίτᾱν] (middle) to consume (much that is moist) 23.162
διακρίνειν] to separate (pass., residues) 15.99
διαλείπειν] to intermit, pause (in the middle of exercise) 31.197
διαμερίζειν] to distribute (moisture) 20.139
διαπαύειν] (middle) to pause (during exercise) 31.198
διαπνεῖν] to blow through, ventilate (the body) 39.247
διάστασις] expansion (?) 32.203, 205
διατείνειν] to stretch; (pass.) to extend 33.212
διά τί] why (do children have greater difficulty sweating) 18.120
διαφέρειν] to differ (of lack of concoction) 10.64
διαφορά] difference; (pl., of qualities of sweat) 1.5; (pl., of varieties of sweat) 11.69, 71
διαψύχειν] to cool; (pass., surface moisture) 39.244
διῖδροῦν] to sweat 30.194
διῖέναι] to pass through (of breath) 1.3; (of moisture) 25.172

- διότι**] why 1.5; 24.163; 32.201; because, since 2.7; 22.151; 39.242
διωθεῖν] to push through; (pass., of eruptions of the skin) 15.98
δριμύτης] pungency (of juices) 16.112
δρόμος] running (and exertion) 27.180; (after a pause) 31.199; (in a cloak) 39.241, 245; (naked) 39.246
δύναμις] force (of heat and breath) 2.13
δύνασθαι] to be able (to be secreted) 13.87; (to cause sweating) 28.188
δυσίδρως] characterized by difficulty in sweating (of children and young children) 18.120; 20.134
δυσώδης] having foul odor (of a region of the body) 9.55; (not true of residues of the intestines) 10.68
δυσωδία] foul odor (of sweat) 5.34

ἐᾶν] to allow (eruptions to settle down) 16.106
ἐγγύς] near (the fire) 28.184; **τὸ ἐγγυτάτω**] what is nearest (i.e., the arms) 34.217
ἐγείρειν] to rouse; (perf. participle) awake (characterizing men who sweat less) 40.248
ἐγκέφαλος] brain 3.19, 21 (the region where phlegm and tears occur); (associated with moisture) 33.209, 212
εἰκάζειν] to liken; (pass.) to take on the appearance (of blood) 12.77
ἐκκρίνειν] to secrete; (pass., of moisture) 1.2; (what is foreign) 2.7; (sweat) 2.12; (residue) 8.52; 13.87; 19.126; (badly made additions to the flesh) 30.196
ἔκκρισις] secretion (of breath) 2.14, (of what is useless) 4.25; (of residues) 12.82; 14.92; 15.96, 100; (of fluid from swellings) 16.111; (balanced) 17.117; (sufficient) 19.130; (cooled by air) 39.247
ἐκπέττειν] to concoct thoroughly (of sleep) 20.140
ἐκπίπτειν] to fall out; to flow out (of moisture) 26.179
ἐκτός] outside; external (heat) 27.183
ἔκφυμα] eruption (of the skin) 14.91
ἔκφυσις] growth (of hairs) 9.55; 33.210
ἔλαιον] oil (applied inside a cloak) 39.241
ἐλάττων] less (heat) 37.234
ἔλκος] ulcer (the result of excessive exertion) 13.83
ἐμπίπτειν] to take to (the road) 15.104
ἔμπροσθεν] before; **τὰ ἔμπροσθεν**] the front (of the body) 32.201, 202
ἐμφράττειν] to block (the passage of water) 25.174
ἐμφυσᾶν] to inflate; (pass., the veins) 25.169
ἐναντίος] opposite; **τοῦναντίον**] 39.246
ἐναντίωσις] opposition, contrariety 7.41
ἐνδιδόναι ἑαυτούς] to apply or exert themselves 17.118
ἐνίστε] sometimes (blood occurs unconcocted) 12.79; (on account of exertion) 17.116

- ἐνόδιος**] road sore (on the thigh and shin) 15.103
ἐνυπάρχειν] to be present (of moisture) 19.130–1
ἐξάγειν] to bring out (moisture) 31.199
ἐξαίρειν] to raise up; (pass.) to rise up (of residues) 16.108
ἐξανάλισκειν] to exhaust, consume; (pass., of food) 2.8
ἐξελκοῦν] to cause (the skin) to ulcerate 13.88
ἐξέρχεσθαι] to go out; (moisture) 25.171; (water in a water-catcher) 25.174
ἔξις] condition (of the body) 6.40; 8.49; 12.81
ἔξω] outside (the body breath becomes sweat) 1.3; 38.239
ἐξωθεῖν] to drive out (of the expansion of breath) 32.205
ἔξωθεν] from outside (the body, of motion) 15.97
ἔπαρσις] swelling (of a pimply kind) 16.110
ἐπειςφέρειν] to add on (to the fire) 28.186
ἐπέρχομαι] to come upon, after; (participle, of fuel which is added later) 28.188
ἐπέχειν] to hinder; (pass., of the intestines and bladder) 20.135
ἐπικρατεῖν] to dominate (of heat) 19.125
ἐπιλαμβάνειν] to close (the opening of a water-catcher) 25.174
ἐπίπαν] ὥς ἐπίπαν] on the whole 19.127
ἐπιπολάζειν] to come to the surface (of heat) 37.233
ἐπιπολαῖος] superficial (of sweat) 11.74
ἐπιπολῆς] on the surface 14.92; τὸ ἐπιπολῆς] the surface 3.16–17; 26.177; the surface (moisture) 39.244
ἐπίρροια] flow to (the bladder) 20.134
ἐπισπᾶν] to draw; (pass., of moisture) 12.77–8
ἐπίτασις] intensification (of exertion) 11.71
ἐργάζεσθαι] to do the work (of nature) 2.11
ἐρεθίζειν] to irritate (eruptions of the skin) 16.106, 115
ἐρεθισμός] irritation (causing pimply swellings) 16.109
εὖ ἔχειν] to be in good condition (of men who exercise) 6.37; 21.142
εὐθύς] straightway (with moisture when it is secreted) 1.2; (making a large fire) 28.185
εὐδρως] characterized by ease of sweating (of whom there is a hinderance of intestines and bladder) 20.136, (who go sleepless) 20.139; (who are in good condition and exercise) 21.142; (who engage in sweating-off) 22.147; (who are in bad condition) 22.151; (who sweat more easily in winter) 23.155; τὸ εὐδρὸν] ease of sweating 19.131
εὐλόγος] reasonable 36.227; εὐλόγως 3.18
εὐπνοια] ease of breathing (of the body) 9.56; 39.242
εὐπνοῦς] breathing well (of the body) 8.50, 51; (of the head) 9.54; τὸ εὐπνοῦν] ease of breathing 19.129
εὐρὸς] having an easy flow (of the intestines) 19.126

εὐρύς] wide (pores) 25.170

εὐχροια] good color (caused by good ventilation) 39.242

εὐχροος] characterized by good color (of men who run naked) 39.246

ζέσις] boiling (of blood) 36.230

ἥλιος] sun (in which one sweats less) 27.181; (dries up moisture) 27.181; 31.200

ἡβη] adolescence (associated with malodorous sweat) 7.42, 45; 8.47

ἡκιστα] least (capable of sweating) 36.228; (exerting itself) least 33.207

ἡλικία] age (of adolescence and older) 7.43, 45

ἡττον] less (to sweat) 28.184, 185; 29.189; (continuous secretion) 2.14; (bad smelling) 7.43; (odor) 9.54; (capable of growth) 7.46; (to be prevented) 32.203

θεραπευτής] one who attends (to the body) 6.40

θερμαίνειν] to heat (of motion) 13.84–5; (pass., of men who are anxious) 36.232

θερμολουσία] hot water treatment (for swellings) 16.113

θερμός] hot (sweat) 10.63; (young children) 18.121; (the body) 35.225; 40.249; (the hot [matter]) 36.231; τὸ θερμόν] heat 2.13; 23.160; 24.164; 27.182; 30.196

θερμότης] heat (causes secretion of residues) 15.100; (concocts) 19.125; (causes secretion of moist breath?) 26.175; (ceases) 26.177; (in the front of the body) 32.202; (not a removal as in fright) 36.229; (dries facial moisture) 37.233

θέρως] summer (when some sweat less) 23.155; (when men consume much moisture) 23.162;

θεωρεῖν] to consider 1.6; 14.95

θυμός] anger (compared with nausea) 36.230; (a boiling of the hot) 36.230

ἱατρός] doctor (Monas) 12.77

ἰδίειν] to sweat 28.184

ἴδιος] one's own (breath) 38.239

ἰδροῦν] to sweat; (ἰδροῦσι) 27.181; 31.198; 32.201; 34.217; (ἰδροῦσι cod. A *supra lineam* emending ἰδρῶσι) 33.211; 34.214; (ἰδρῶσι) 24.163; 25.166; 29.189; 33.207, 211; 34.214; 36.226; (other forms) 28.186; 34.221; 38.236

ἰδρώς] sweat *inscr.* 1; 1.2; 2.10, 12; 3.19; 4.23, 27; 6.38; 7.43; 9.57; 10.63; 11.70, 74; 13.85; 16.109; 18.122; 19.128, 133; 20.140; 21.146; 23.161; 24.165; 26.179; 30.194; 32.204; 35.224, 225; 38.239; 39.241; 40.248, 250

ἰδρωτικόν] capable of sweat (of the face) 36.227

ἱκανός] sufficient (secretion) 19.129

ἱμάτιον] cloak (running while wearing) 39.241; (anointing with oil underneath) 39.242

ἰονθώδης] pimply (swellings) 16.110

ἰστάναι] (pass.) to stand (close to the fire) 28.184; (second aor.) to stand (still, of a person) 29.192; (of moisture) 38.238

ισχύειν] to be strong (in a region of the body) 34.216, 217

καθάπερ] as (a material) 19.128; (neither do the residues) 10.67; as, like (water from water-catchers); 25.172; (the sun and the wind do) 31.200; (in anger) 36.230; as it were (steaming) 2.15; (from flesh and veins) 3.19; (opened up) 25.170–1; as (Monas said) 12.77

καθ' αὐτά] in themselves (eruptions) 14.95

κάθεξις] restraining (the breath) 25.171; 29.190; 33.212; 34.220

καθιστάναι] to work a settling effect (of a mild douche) 16.114

καθόλου] generally (said) 7.42

καίπερ] although (naturally hot and moist) 18.121

κακεργασία] bad work (of lack of concoction) 10.65

κακώδης] malodorous (sweat) 1.5; 5.30; (superl.) 9.58; (secretion) 8.53; (persons when they sweat) 6.38; 7.43

κακωδία] bad odor (of sweat) 5.31; 8.49; 9.59, 60; 10.65; (a kind of rotting) 9.56; (caused by rue) 10.61

κακῶς] badly (added to the flesh) 30.195; **κακῶς ἔχειν**] to be in bad condition 21.143; 22.150

καλεῖν] to call (pass., of sweat) 2.10; 26.178; (road sores) 15.103

κάμνειν] to be sick (connected with malodorous sweat) 6.39

καρδία] heart (mentioned in the definition of anger) 36.230

κατακρατεῖν] to control (pass., absent in the case of some change and alteration) 10.67

καταπέττειν] to concoct (pass., of food) 22.149

κατάπνιξις] smothering (causes bad odor) 9.58; (causes lack of color) 39.243

κατάστασις] condition (of the body conducive to sweating) 23.160

καταψύχειν] to cool (secretions) 39.246; (pass., breath) 1.4

κατέχειν] to hold down (the swelling) 16.112; restrain (the breath) 25.167; 34.216, 218

κάτω] downward (below the water) 30.193

καῦμα] heat (of summer) 23.157 (twice)

καχεξία] bad condition (of the body) 5.33; 6.38; 15.96; 17.116

κεφαλή] head (odorless sweat) 9.53; (breathes well) 9.54; (moist and wet) 33.208; (restraining the breath extends there) 33.213

κινεῖν] to move (eruptions and swellings of the skin) 16.106, 107, 111, 115; 27.183

κίνησις] motion; (bodily) 2.12; 13.84; 15.98, 99, 102; (of air) 29.191

- κλεψύδρα]** water-catcher 25.173
κνήμη] shin (where eruption occurs) 15.105; (placed in water) 35.222
κνησμώδης] of a scratching kind (of an irritation) 16.110
κοιλία] hollow or cavity (of the body) 9.59; stomach 5.32; intestines 10.68; 19.126; 20.133, 135
κοῖλον] cavity (of the body) 9.57
κοῦφος] light (superl., of what is consumed) 2.8–9
κράσις] blend (of the body) 6.37
κρατεῖν] to dominate (of bodily elements) 15.98
κύστις] bladder (where what accumulates is called urine) 2.9; (greater flow to) 20.134; (being hindered) 20.135
κωλύειν] to prevent (sweating) 19.132; 29.191, 192; 35.223; (the passage of moisture) 25.172; (liquefaction) 30.194; (pass.) 32.203
- λαμβάνειν]** to take or understand (generically) 5.31; assume (no excess of cold or heat) 23.156; adopt (an explanation) 34.215
λειχήν] scurvy (caused by residues in the body) 14.90
λέπρα] leprosy (caused by residues in the body) 14.90
λεπτός] thin (sweat) 11.75
λεπτότης] thinness (in sweat) 11.73
λήγειν] to cease (sweat) 11.70; (heat) 26.177; (restraining the breath and movement of air) 29.192
λόγος] discussion (in a different place) 1.4; account (the preceding) 4.23
- μάλιστα]** superl. adv., vid. *μᾶλλον*; most, especially (to sweat) 33.207, 211; 34.214; (capable of sweating) 36.227; (having difficulty sweating) 18.121; (bad smelling) 7.42; (driven toward sexual activity) 8.47; (road sores to occur) 15.104; (to effect settling) 16.114–15; (to be strong) 34.216; (to restrain the breath) 34.218
μᾶλλον] more (to sweat) 24.163; 25.166; 27.180; 28.186; 31.197; 32.201; 34.217, 221; (to drive out sweat) 32.205; (sweat occurring) 40.248; (moisture, breath and heat) 24.164 (moisture passing through pores) 25.171; (sweating easily) 20.136, 139; 23.155; (having difficulty sweating) 18.120; (sharing exertion) 34.219; (being heated) 36.232; (from deep within) 11.75; (expansion?) 32.204; **τὸ μᾶλλον καὶ ἥττον]** the more and less 4.27–8; **μᾶλλον εὐλογον]** more reasonable 36.227; **ἀλλὰ μᾶλλον]** but rather 36.229; vid. *μάλιστα*
μανός] rare in texture (of the body, regions of the body) 9.58; 21.144; (the head) 33.208; **τὸ μανόν]** rarity (of skin) 19.129; 33.210
μανότης] rarity in texture (of skin or flesh) 8.50; 9.55; 33.208–9
μανόχρους] characterized by rarity of skin (of aged men) 19.128
μαρτυρεῖν] to bear witness, support (an account) 4.23

μασχάλη] armpit (where sweat has the worst odor) 9.57
μένειν] to be lasting, permanent (of a bodily condition) 8.50
μερίζειν] to distribute; (pass. of residue) 20.136
μέρος] part (of the body) 30.193; 34.219
μέσος] middle; **τὸ μέσον**] moderation (in cold and heat) 23.158
μεσοῦν] to be in the middle (a stage in sweating) 11.70
μεταβολή] change (in food) 3.20; (in the body) 8.48; (?) 10.65, 66
μετάστασις] removal (of heat as in fright) 36.228
μέτωπον] brow (where men especially sweat) 33.211
μηρός] thigh (where rode sores occur) 15.104
μοχθηρός] bad (juices) 13.86
μύρον] myrrh oil (cause of malodorous sweat) 10.61

ναυτία] nausea (caused by cooling) 38.240
ναυτιᾶν] to suffer from nausea (when cooled) 38.236, 237

ξηραίνειν] to dry (of heat) 37.233, 234
ξηρός] dry (not a source of heat) 20.140; (of aged men) 19.128; (of summer weather) 23.159
ξηρότης] dryness (of aged men) 19.131

ὁδός] road; **εἰς ὁδὸν ἐμπίπτειν**] to take to the road 15.103
οἶος] **οἷά τις**] what sort of (?) 8.49; 10.66; **οἶον**] like, for instance (followed by one or more examples) 13.86; 16.112; 23.156, 157; as it were (followed by a bold expression) 2.11; 29.191; 30.195
ὀλίγος] little (external heat) 27.183
ὅλος] whole or entire (body) 9.60; (blend of the body) 6.36; **τὸ ὅλον**] generally 22.153; **ὅλως**] generally 5.33; 6.40; 9.57; 14.90; 27.182
ὁμοιοσχημονεῖν] to be like in form; to maintain the same position 34.215
ὀξύς] acidic (sweat) 1.5; 5.30; (bodily juices) 13.87; (juice for holding down swelling) 16.112
ὀπισθεν] behind; **τὸ ὀπισθεν**] the back (of the body) 32.201
ὀρμᾶν] to hasten, have a tendency toward (of moisture within the body) 20.135
ὀρμή] drive (toward sexual activity) 8.47; (toward eruptions of the skin) 16.107
οὔρον] urine (as foreign matter comparable to sweat) 2.10
ὀσμή] odor (of sweat) 5.30

πάθος] affection (resulting in saliva and tears) 3.22
παιδίον] young child (in contrast to a child and a man) 18.121, 124; 19.127
παῖς] child (in contrast to a young child and a man) 18.120, 123
παλαίειν] to wrestle (intermittently) 31.197
πάλη] wrestling (brings out moisture) 31.199; (paired with rubbing) 32.203
πάλιν] again (expressing opposition) 4.26; 20.135, 21.142

- παντελῶς**] entirely (incapable of growth) 7.46
παραπίμπρασθαι] to be enflamed (of shins) 15.105
παραπλήσιος] similar (manner) 14.89
παρορμᾶν] to have started, incline (the body) 28.187
πᾶς] all (sweat) 4.23; (factors contributing to bad odor) 8.48; (cases of secretion) 12.81; (moisture) 20.134; (bodily parts) 40.249
πάσχειν] to be affected (with bad odor) 9.59; (by an emotion) 36.231; (contrasted with **ποιεῖν**) 23.161
παύειν] to stop; (middle, exerting oneself) 25.166, 170; 26.177; (running) 29.190, 192
παῦλα] cessation (of eruptions) 14.94
παχύς] thick (residues) 13.86
παχύτης] thickness (of sweat) 11.74
πειρᾶν] to try (to consider) 1.6; (middle, to hold down the swellings) 16.113
πεπτικός] capable of concoction (of adolescents) 7.45
περίκλυσις] douche (emendation, for treating swellings) 16.114
περίττωμα] residue (secretion of) 12.82; 14.92; (exuded together with sweat) 13.85; (of the intestinal cavity) 10.68; (secreted through the intestines) 19.126; (associated with a bad bodily condition) 22.154
περίττωσις] residue (carried up to the flesh) 20.136–7
περιττωματικός] productive of residue (not true of aged men) 8.51
πέττειν] to concoct (of heat) 19.125; (pass., of what is sweet) 3.16; (of hot sweat) 10.64; (of food) 21.143; 22.150
πέψις] concoction (distributes moisture) 20.139
πήγανον] rue (causes bad odor) 5.35; 10.61
πηγνύναι] to make solid, thicken; (pass., of breath) 1.3
πικρός] bitter (juices) 13.87
πικρότης] bitterness (of juice) 13.89
πλείων] comp. of **πολύς**; greater (flow of moisture) 20.134; more (moisture) 12.78; (sweat) 32.202; (heat) 37.234; (dryness) 19.131; **ἐπὶ πλείον**] on a larger area 15.104; **τὸ πλείον**] for the most part 28.188; **πλείον**] (adv.) 26.179; 32.206; **πλείω**] (adv.) 6.40; 13.83
πληθος] (large) quantity (of residue) 13.88; 15.101; 22.154; (of moisture) 22.151
πλήρης] full (water-catchers) 25.173
πληροῦν] to fill (the veins) 25.172
πνεῦμα] breath (when cooled becomes sweat) 1.3; 26.178; (invisible secretion of) 2.14; (separated from the moist) 26.176; (causes nausea) 38.238; inhaled breath (being restrained) 25.167, 172; 29.190; 33.212; 34.216, 218, 220; (causes veins to be inflated) 25.169; (causes sweating) 2.13; 24.164; (expansion of) 32.205; wind (causes drying) 31.200; (cools the body) 38.236
ποιεῖν] to act (contrasted with **πάσχειν**) 23.161; to make or cause (the secretion to be sufficient) 19.130; (pores to close up) 25.169; 29.191; to make or

produce (foul or bad odor) 5.34; 9.59; (cessation of eruption) 14.94; (eruption) 15.102; 17.119; (shivering) 23.157; (a large fire) 28.185; (nausea) 38.240; (men lacking color) 39.242; (lack of color) 39.244; (middle) to engage in (sweating-off) 22.147; to produce (secretion) 16.111; (pass., secretion) 15.100

πολλάκις] often (the cause of absence of concoction) 5.33; (swellings arise) 16.108; (has been said) 12.80; 40.250

πολλαχόθεν] from many things (it is clear) 6.38–9

πολύς] much (spray or douche) 16.114; (external heat) 27.182; (fire) 28.185; (pl.) much (moisture) 19.130; many (persons) 6.37; 15.103; (signs) 33.209; **τὸ πολὺ**] much (that is moist) 23.162; vid. **πλείων**

πονεῖν] to exert oneself (causing sweat) 34.217; (inhibiting sweat) 25.166, 168; (least, of the face) 33.208; (causing ulcers) 13.83

πόνος] exertion (causing sweat) 2.12; 22.152; (causing varieties of sweat) 11.71; (after which sweating in the shade) 27.180; (absent along with sweat) 32.204; (causing residues to be secreted) 15.97; (road sores) 15.102; (excessive and moderate) 17.116, 118

πόρος] pore (open and/or closed) 8.48; 18.124; 21.145; 22.148; 25.170; (through which secretion occurs) 26.176

πορρωτέρωθεν] from a greater distance (of sweat which is drawn) 4.24

ποῦς] foot (in water) 35.222; (where sweat occurs when men are nervous) 36.226; (where colliquescence occurs) 37.233

πρέσβυς] comp. pl. older men (in contrast to adolescents and aged men) 7.46; 8.49

προιέναι] to go forward, advance (of age) 7.43

προλέγειν] to say beforehand; (pass.) 35.223

προοδοποιεῖν] to prepare; (pass. of the body in regard to sweating) 28.186–7

προσδεῖσθαι] to be in need of (exertion) 15.97

προσοικοδομεῖν] to build in addition, as an addition; (pass.) added (to the flesh) 30.195

προσπίπτειν] fall upon; attack (the region where breathing occurs) 38.240

προσφορά] taking or eating (foods) 5.34

πρόσφυσις] natural assimilation (of food) 4.24

πρόσωπον] face (where men sweat most) 33.207; (but not when nervous) 36.227

πρότερος] (acc. as adv.) previously (not slack) 38.238; **τὸ πρότερον**] the earlier (assertion) 4.23; **τὰ προτερον**] the things first (mentioned) 6.36

προὔπαρχειν] to be present beforehand (of heat) 37.235

πρῶτος] first (variety of sweat) 11.74; (acc. as adv., to sweat) 33.211

πτύελον] sputum (salty) 3.22

πυκνός] dense (of the skin) 18.123 (twice)

πυκνοῦν] to make close (the pores) 27.182

πῦρ] fire (as a cause of sweating) 28.184, 185

ῥάδιος] easy; ῥᾶον] (comp. adv., sweat flows out) 26.179

ῥίγος] shivering (caused by very cold weather) 23.157

ῥιγοῦν] to be cold (of moisture within the body) 38.238

σάρξ] flesh; (the nature of) 2.8; (through which breath passes) 1.3; (in which sweat accumulates) 2.10; (from which sweat comes) 3.19; (to which residue is carried) 20.137; (colliquescence of) 11.76; (liquefaction of badly made additions) 30.195; (ulceration of) 13.88

σημεῖον] sign (of being capable of concoction) 7.45; (of moisture and rarity) 33.209

σήπειν] to make rotten; (pass., connected with bad odor) 9.56

σῆψις] rot (connected with bad odor) 9.57

σιτίον] food; (pl., unconcocted) 20.138

σκεπτέον] one must consider 4.26

σκιά] shade (where men sweat more) 27.180

σπειρᾶσθαι] to be coiled (corrupt?) 14.92

στρυφνός] astringent (juice) 16.112

συγκλείειν] to close up; (pass., of pores) 18.124

συμβάλλειν] (middle) to be a contributing factor (of certain foods) 6.35

συμβεβηκός] pf. part. συμβαίνειν; κατὰ συμβεβηκός] *per accidens* 34.215

συμμετρία] balance (of secretion) 17.117

σύμμετρος] proportionate (of moisture removed as sweat) 22.152

συμμύειν] to be closed (of pores) 22.148; 25.169

συμπονεῖν] to share the exertion (while being rubbed) 34.219

συμφέρειν] to be beneficial (not to irritate eruptions) 16.106, 111

σύμφυτος] natural (heat in the feet) 37.235

συναθροίζειν] to collect; (pass., moisture) 31.198

συνεκκαλεῖσθαι] to call forth (an internal drive toward eruption) 16.107

συνεξικμάζειν] to cause to exude (of motion which is a source of heat) 13.85

συνεργεῖν] to work together (of fire and a body inclined to sweat) 28.187

συνεργός] working together; contributing (to bad odor) 8.48

συνεχής] continuous (secretion) 2.14; (ventilation) 19.130; (exercise) 31.200;

συνεχῶς] continuously (exercising) 31.198

συνήθης] accustomed, habituated (with regard to sweating) 21.145

συνθερμαίνεσθαι] to be heated as well (of the upper body) 35.225; thoroughly (of surface moisture) 39.243

συνίζειν] to contract (of veins) 25.170

συνίστασθαι] to condense (of breath) 1.4; to collect (of secretion) 39.247

συντείνειν] to make tense (the breath) 25.167

- συντήκειν**] to cause colliquescence (through exertion) 17.118–19 ; (in the feet) 37.234; (pass., of flesh) 11.76
- σύντηξις**] colliquescence (resulting in salty saliva and tears) 3.21; (produced by an excess of heat) 23.158
- σχῆμα**] figure; position (of the body ?) 35.223
- σῶμα**] body (steaming) 2.15; (whose blend causes bad odor) 6.36; (which breathes well) 8.51; (contrasted with the head in regard to bad odor) 9.54; (connected with lack of concoction 9.60; (alteration of) 11.72; (condition of) 12.81; (impurity of) 13.84; (rare in texture) 21.145; (prepared to sweat) 28.187; (ventilated by air) 39.247
- τῆξις**] liquefaction (prevented by water) 30.194; (characterizes sweat) 30.194
- τόπος**] region (of the body, which has a foul odor) 9.55; (which is rare in texture and concave) 9.58, 59; (to which residue is carried) 20.137; (where men are most strong) 34.216; (where breathing occurs) 38.240
- τρέχειν**] to run (sweating less) 29.189; (intermittently) 31.197
- τρίβειν**] to rub (the arms) 34.214, 220; (pass., on the arm) 34.218–19; (on some other part) 34.219
- τριχῇ**] hair (associated with ventilation) 9.55; (reveals rarity of the skin) 33.209
- τρίψις**] rubbing (paired with wrestling) 32.203
- τρόπος**] kind (of bad odor) 5.31; manner, way 14.89, 93; 19.132; 24.163
- τροφή**] food (source of sweat) 3.18, 20; (concocted and unconcocted) 21.144; 22.149, 150
- τύπος**] general character; **τύπω**] generally 3.20
- ὑγρός**] moist; (of young children) 18.121; (the intestines of children, and generally) 19.127; 20.133; (breath) 38.239; (the head) 33.208; (part[s] of the body) 35.225; 40.249; **τὸ ὑγρόν, τὰ ὑγρά**] moisture 23.159, 162; 24.164; 25.171; 26.176; 33.210; 38.237; 39.244
- ὑγρότης**] moisture (secreted) 1.2; (a change of ?) 10.66; (drawn from the veins) 12.78; (distributed by concoction) 20.140; (large quantity of) 22.151; (which is called sweat) 26.178; (collects during a pause) 31.199; (greater in the front of the body) 32.202; (in the head) 33.208
- ὑδατώδης**] watery (sweat) 3.17; 11.75
- ῥῶρ**] water (in the water-catcher) 25.173; (prevents sweating) 30.193, 194; 35.222, 224; (cools the body) 38.237
- ῥλη**] matter or material (for sweat) 19.128
- ὑπάλειψις**] anointing (with oil inside a cloak) 39.245
- ὑπάρχειν**] to be present (as a material) 19.129
- ὑπεναντίος**] contrary (of men with opposite bodily conditions sweating easily) 21.141
- ὑπερβολή**] excess (of exertion) 17.116; (of winter cold and summer heat) 23.156

- ὑπνος]** sleep (concocts) 20.140; (when men sweat more) 40.248
ὑπολαμβάνειν] to assume (as cause or explanation) 18.123; 23.159
ὑπόστασις] accumulation (of urine) 2.9
ὔστερον] later (of adding fire) 28.186; (bringing out sweat) 31.199
ὑφίστασθαι] to accumulate (of urine) 2.12
- φανερὸν]** clear (that) 6.39; 15.96; 15.102; (why) 24.163; **φανερῶς]** clearly (a matter of the more and less) 4.28
φέρειν] to carry; (pass., down below the water) 30.193
φλέγμα] phlegm (compared with sweat) 3.17
φλέψ] vessel, blood vessel (source of sweat) 3.19; 12.78; (inflated by restraining the breath) 25.169, 172
φόβος] fright (distinguished from anxiety) 36.229, 231
φυσικός] natural (change and alteration) 10.67
φύσις] nature (of flesh) 2.8; (of the body, itself doing the work) 2.11; (of young children) 18.121
- χειμών]** winter (when some seem to sweat more easily) 23.155
χείρ] hand; arm (rubbing) 34.214, 218
χλιαρός] mildly warm (douche) 16.114
χρή] it is necessary (to consider) 14.95
χρησθαι] to use (hot and cold water treatments) 16.113; (the pores) 22.148
χρονίως] for long periods (engaging in sweating-off) 22.146
χρῶμα] color (corrupt?) 7.44
χρῶς] skin (of children) 18.123
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χυμός] juice (bad) 13.86; (bitter) 13.89; (unconcocted) 14.91
- ψῦχος]** cold (of winter) 23.156
ψύχειν] to cool; (pass., men by wind) 38.236; (moisture in the body) 38.238; (breath within) 38.239
ψυχρολουσία] cold water treatment (not a cure for swellings) 16.113
ψυχρός] cold (sweat) 10.63; (winter season) 23.159
ψώρα] scab (an eruption of the skin) 14.90
- ῥα]** adolescence 15.99
ῥσπερ] as (having been concocted) 10.63; (when there is colliquescence) 11.76; as, just as, like (phlegm and tears) 3.17; (in the other cases of exertion) 17.117; (they cause colliquescence) 17.118; (that in the area of the brain) 3.20; (in fright) 36.229; as it were (slightly colored) 12.78; (pores which are closed up) 18.124; (contrary) 21.141; as (they say rue does) 5.34; (has been said) 12.80; 17.115

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Theophrastus, *On Dizziness*

R. W. Sharples

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PREFACE

My interest in this text dates back for nearly twenty years, to a time when there was a possibility that the less accessible of Theophrastus' *opuscula* might be included in the collection of fragments and testimonia eventually published in 1992. More recently, versions of the discussion on which the Introduction and the Commentary are based were presented in 1995-1996 to the Open University London Region Classics staff seminar, to the UCL Greek and Latin departmental seminar, to the Classical Association conference in Nottingham, and to a conference on Theophrastus organised by André Laks in Lille; and in 1998 to the UCL Science and Technology Studies departmental seminar. Sabine Vogt and Caroline Oser-Grote discussed the work at the Theophrastus conference in Trier in 1999. I am grateful to all who participated in the discussion on those occasions and to others with whom I have discussed this text. My thanks are especially due to Han Baltussen, Sylvia Berryman, Bernard Besnier, István Bodnár, Richard Buxton, Victor Caston, Armelle Debru, Philip van der Eijk, Bill Fortenbaugh, Anthony Gordon, Andrew Gregory, John Haight, Thomas Johansen, A.R. Jonckheere, André Laks, Glenn Most, Carolin Oser-Grote, Marlein van Raalte, David Runia, Michael Sollenberger, Konrad Steiger, Alan Towey, John Vallance, Sabine Vogt and Stephen White. None of them, of course, is to be held responsible for the use or misuse I have made of their advice.

I join in Bill Fortenbaugh's acknowledgment of the assistance given to this enterprise by various libraries (above, p.3). In particular, it was in the later stages of working on this text that I first made extensive use of the impressive and efficient facilities of the new British Library—both the Rare Books Reading Room and the Science Reading Rooms. Above all, I am grateful for the continued support and encouragement of my wife Grace, throughout the twenty-five years of marriage which we celebrated this year. It is to her that I dedicate my share in this volume.

R.W.S.
University College London
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INTRODUCTION

1) The Phenomenon and its Causes

In approaching this Theophrastean text there is an immediate problem of how to identify, and how to translate into English, the experience which it is concerned to explain. I use the term “experience” advisedly, for, as Sabine Vogt in her forthcoming discussion points out,¹ dizziness is a matter both of subjective experience and of changes in behaviour observable by others. Greek expressions do not have a one-to-one correspondence with English ones, and the problem this causes is intensified when we are concerned in part with subjective experience. In these circumstances, two approaches seem indicated; one is to investigate the usage before Theophrastus himself of ἴλιγος, which is the term generally used in this essay, and of cognate forms; the other is to examine the experiences Theophrastus himself considers here and to consider what words we would use to describe the features which they apparently have in common.

The first approach has been ably followed by Vogt, whose discussion I will not reproduce here. One of her examples is however particularly striking: in Aristophanes’ *Acharnians* (1218) Lamachus returning from battle, says εἰλιγγιῶ κόρα λίθω πεπληγμένος, “I am dizzy having been struck on my head by a stone”. As for Theophrastus himself, the text discusses experiences produced by a number of different causes—rapid movement, especially circular movement; looking at moving objects; looking downwards from high places; and the effects of drink and drugs.²

One may be tempted to say that what these experiences have in common, in our terms, is the sensation of loss of balance (if standing) and of lack of co-ordination between our visual experience and our sense of our own position. And in that case it might seem that “giddiness” would be the appropriate translation. To my ear at least “giddiness” has

¹ Vogt 2002. Details of works identified by author’s name are given in the Bibliography.

² Interestingly, Theophrastus does not himself discuss dizziness caused by blows to the head: I am grateful to Anthony Gordon for pointing this out.

to do with inability to retain one's balance, specifically, in a way that "dizziness" does not.³ But there is a danger of imposing a greater uniformity on the experiences Theophrastus discusses than the text itself warrants, particularly if one is influenced by the prominence of examples involving rotatory movement in the earlier part of the essay and by the references to rotatory movement in the brain in the *explanations* which Theophrastus gives—from which it does not follow that all the experiences described are those which we would connect with actual rotatory movement of the *body*. Aristophanes' Lamachus might say that he was "giddy", but "dizzy" seems the much more natural translation in the circumstances.

The matter is further complicated by the fact that at one point only, in §7 referring to the effect of looking at rotating objects, Theophrastus uses the term σκοτοῦσθαι, etymologically connected with the notion of darkening. Dizziness may be accompanied by a lack of clarity of vision and in extreme cases by loss of consciousness altogether; those who feel faint feel dizzy, and those who swoon may feel dizzy first. But dizziness is not always accompanied by these further features, and they are not always accompanied by a sensation of loss of balance specifically.⁴ σκοτοῦσθαι and its cognates are used by Hippocrates⁵ and by Plato for blurring of vision; one may especially note Plato, *Protagoras* 339e, where the initial effect on Socrates of Protagoras' exposition of Simonides' poem is that, like somebody struck by a good boxer, ἐσκοτώθην τε καὶ ἱλιγγίασα—"everything went dark (or "blurred"?) for me, and I felt dizzy," and the same combination at *Laws* 892e. Inability to see clearly and the effects of circular movement are combined in the Hippocratic term σκοτοδινεῖν,⁶ and Aristophanes'

³ The *Concise Oxford Dictionary* includes "dizzy" among the meanings of "giddy", and vice versa. However, it gives "dazed" and "confused" for "dizzy" but not for "giddy", suggesting that the latter has the more specific sense.

⁴ Grangerius 1576, p. 34 recto-34 verso argues that Theophrastus uses ἱλιγγος as the wider term to cover both giddiness, in the sense of things seeming to spin around, and black-outs. Cf. also de Baillou 1734, p. 271, contrasting *vertigo* and *tenebricosa vertigo*. Garofalo 1997, p. 111 n. argues that σκοτωματικοί was the later medical term for sufferers from what was earlier called ἱλιγγος.

⁵ Hippocrates, *Epidemics* 1.2.6 Littré.

⁶ Cf. Galen, in *Hippocratis aphorismos comm.*, vol.17.2 p. 677.4ff. Kühn: σκοτόδινος δ' ἐστίν, ἐπειδὴν ἅμα περιδινεῖσθαι δοκῇ τὰ βλέπομενα, ἢ τε διὰ τῆς ὀψεως αἰσθησις ἐξαίφνης ἀπολείται, δοκούντων αὐτῶν σκότος περικεχύσθαι. γίνεταί δὲ τοῦτο τοῦ στόματος τῆς κοιλίας ὑπὸ μοχθηρῶν χυμῶν δακνομένου. I am grateful to

Lamachus goes on to apply σκοτοδινιῶ too to his condition, but Theophrastus does not use the compound form. Given that there is no very natural and simple English equivalent for σκοτοῦσθαι, and that the context in §7 is concerned with such cases as the effect of looking at rotating wheels, I have used “giddiness” to render σκοτοῦσθαι and its cognates. Diogenes Laertius (5.44), unlike Photius and the MSS, includes a reference to σκότωσης in the title of our text: Περὶ ἰλίγγων καὶ σκοτώσεων, *On (cases of) Dizziness and Giddiness* (for the plural see below, n. 11, and p. 198).

Dizziness in its various senses can come about for a wide variety of reasons; in addition to those Theophrastus mentions one might add altitude sickness, anaemia, hyperventilation, poisoning,⁷ ear disease (e.g. Ménière’s disease), epilepsy, and other causes.⁸ It is noteworthy that, although Theophrastus in our text discusses dizziness originating from more than one cause, he seems to make no attempt to correlate different varieties of the subjective experience with differing causes,⁹ as he did, for example, in the *Meteorology*.¹⁰ On the contrary, he attempts to find a single theoretical explanation in terms of separation or disequilibrium of fluid in the head caused by some form of interference with its natural condition; as he says in §1, “it makes no difference whether the origin of movement is external or internal”, a physiological effect of consuming substances such as wine or the result of a deliberate movement of the

Armelle Debru for drawing my attention to this passage. Cf. also Grangerius 1576, loc.cit.; Furlanus 1605, p. 261.

⁷ It may be noted that there are no explicit references to dizziness caused by drugs—or by poisoning by fungi—in the pharmacological book 9 of Theophrastus’ *Historia Plantarum* (on which see Preus 1988, pp. 76-99). Indeed, forms in ἰλίγγ- or σκοτο- occur nowhere in Theophrastus’ extant works outside our essay on dizziness.

⁸ Cf. Brandt 1999, pp. 3-19; also Vogt 2002.

⁹ For the correlation of phenomena with explanations in Aristotle and Theophrastus see Gotthelf 1988.

¹⁰ Kidd 1992, pp. 303-4. Kidd stresses the difference between Theophrastus’ methodology and Aristotle’s in his *Meteorology*; but they share the feature of seeking to correlate phenomena with explanations (see Gotthelf, cited in the previous note), even if Aristotle’s preference is for the single explanation and Theophrastus’ for the multiple. For another Theophrastean essay with limited theoretical ambitions, *On Fish*, cf. Sharples 1992, pp. 357-8. (I do not wish here to take any position on how far different cases of dizziness may *in fact* have similar causes: my point is simply to contrast what Theophrastus does here with his general theory and with his practice elsewhere. I am grateful to Anthony Gordon for emphasising this distinction.)

head. In effect, he is attempting to find an explanation that will work both for artificially induced dizziness as the result of swift rotary movement, and also for dizziness which is the result of internal pathological processes (if such a term does not give the drunkenness of §11 too exalted a status); and he might with some justice be accused of reducing the latter to the former.¹¹

This is not however to say that Theophrastus' explanation is entirely consistent. The argument given in §§1-2 is that fluids cannot easily be made to rotate uniformly. This might seem to suggest that the problem is in the presence of any circular movement of the fluid, but §9 suggests that the contents of the head have a natural type of rotation, so the point must be that *added* circular (and other) movement interferes with this, or perhaps (see below on §10) that movement is desirable for some parts and not others. However, it is not clear that Theophrastus' position is fully worked out, and there is some ground for suspicion that it develops in an *ad hoc* way as the discussion progresses.

Theophrastus' explanation is in one way not actually all that far from the truth, some types of dizziness at least having to do with movement of fluid in the semicircular canals in the ear, though Aristotle and Theophrastus did not know that. On the other hand what is in fact at issue is the movement of fluid in solid channels, not the relative movement of parts within a non-uniform fluid as with the raw eggs in §2 which are hard to spin. Moreover, the reason for the characteristic snap of the head of pirouetting ballet-dancers is to *stop* the fluid in the semicircular canals from setting up a regular and even rotation, in which case Theophrastus' theory, that dizziness is linked with *irregular* movements of cerebral fluid, will be the exact reverse of the truth.

The fact that the importance of the brain was not generally realised by Aristotle or by Theophrastus makes the role given to the head in the explanation of dizziness all the more striking.¹² Presumably it is because

¹¹ See further below, pp. 176-7. Vogt 2002 notes that madness is linked with an unnatural degree of moistness of the brain and consequent movement at Hippocrates, *On the Sacred Disease* 14. White 2002 argues that the singular is used in Theophrastean incipits where the starting point of a discussion is what is generally regarded as a single phenomenon, and the plural, as here, where it is a matter of disparate phenomena. One may however note the reference to "the experience" in the *singular* at the start of §3. For my use of the singular in translating the title see below, p. 198.

¹² However, as Vogt 2002 notes, Theophrastus in *On Sensation* 26 reports, without explicit disagreement, Alcmaeon's view that the senses are impeded when the brain is

that is where the sensation is in fact felt. What exactly the fluid, or fluids, in question are, and how they relate to the perceived anatomical structure of the brain, remains obscure.¹³ “Fluid” can be applied to relatively viscous substances, as is shown by the analogy in §2 with the white¹⁴ of a raw egg, and Aristotle refers to the “fluidity” (ὕγρότητα) of the brain at *PA* 2.14 685b3; he also says at *GA* 2.6 744a27 that the human brain is more fluid than that of any other creature.¹⁵ Even so, it might seem unlikely that Theophrastus could have supposed that the brain itself as an anatomical structure was sufficiently fluid in the sense required by his argument, and in §1 he refers to “the region around the brain” as “fluid by nature”.¹⁶ The brain is in fact surrounded by cerebrospinal fluid, and Aristotle refers to fluid around the brain at *GA* 2.6 744a8-9; but it seems questionable whether Theophrastus, not realising the specific function of the inner ear, can have regarded disturbances in this fluid as sufficient to produce the result of dizziness, whereas he might have regarded disturbance of the brain as a whole as capable of doing so.¹⁷ It is unclear, too, how we are to understand

moved and changes its position. How far Theophrastus may be influenced by the doctrine of rotations in the head in Plato’s *Timaeus* (36-37, 43-44, 90) is uncertain; cf. especially 11.90-91 “for both (colliquescence and residue) *weigh upon and separate the rotations (in the head), and this is what dizziness is.*” (I am grateful to Stephen White for this point.) See also Hippocrates, cited in the previous note.

¹³ For the sake of brevity I have therefore in my discussion used “the brain” to refer to the contents of the skull, without attempting to distinguish between the brain as an anatomical structure and any fluids that might be supposed to surround it or be contained within it.

¹⁴ Is the yolk too regarded as fluid? The reference to non-uniform fluids in §1 is perhaps more naturally applied to the contrast between yolk and white than to differences in consistency within the white. Vogt 2002 regards the brain as analogous to the yolk of the egg in Theophrastus’ example, and the cerebral fluid surrounding it as analogous to the egg-white.

¹⁵ I am grateful to Sabine Vogt for drawing my attention to this passage. At *PA* 2.7 653a20-27 Aristotle says that the brain is composed of earth and water and so becomes hard when boiled; cf. Clarke 1963, who remarks (6) that Aristotle may have regarded the brain as fluid either through observation of the cerebro-spinal fluid (below) or because the specimens he examined were in a state of advanced post-mortem degeneration.

¹⁶ Furlanus 1605, p. 262 interprets this as simply a figurative expression for “the brain”. De Baillou 1734, p. 271bis (for the pagination see the Bibliography) says he does not understand how Theophrastus could have described the region around the brain as anything other than dry. Theophrastus, *On Sweat* §3 also refers by implication to fluid around the brain.

¹⁷ Clarke, *op. cit.* p. 4 n. 20. Cerebro-spinal fluid also fills the ventricles, but in

Theophrastus' claim in §§7-9 that certain visual experiences induce dizziness by a connection between the mechanism of sight and the interior of the head. Indeed not only the role given to the head in the process of vision, but also the apparent explanation of vision itself in terms of a physically extended visual ray, seem in conflict with what is commonly regarded as Aristotelian orthodoxy, though as we shall see the latter is not without Aristotelian antecedents.

2) The Structure of the Essay, and its Subsequent Influence

As Vogt 2002 has shown, the structure of *On Dizziness* is governed throughout by a logical development: the reference in §6 to watching other runners effects a transition from the discussion of dizziness caused by running in a circle to that caused by various other visual experiences, and the explanation in §9 of dizziness caused by looking fixedly at the same object not only follows on naturally from that of the contrasting visual experiences in §8, but also leads in turn to other cases similarly attributed to disturbance of the natural order of the substances in the region of the brain.¹⁸ It is thus not simply a matter of an introductory section of general theory followed by a catalogue of particular examples.¹⁹ However, the explanation in terms of separation or disequilibrium in the brain, introduced at the outset in §§1-2, is a systematic theme throughout the treatise, even if there are some difficulties;²⁰ indeed, as we have already seen, Theophrastus might be

antiquity the ventricles were generally regarded as filled with πνεῦμα; cf. Manzoni 1998, and for the role of πνεῦμα in Theophrastus' physiology cf. Sharples 1995, pp. 2 and 28-29.

¹⁸ Caroline Oser-Grote has drawn attention to the discussion of the literary structure of Theophrastus' *opuscula* in Steinmetz 1964, pp. 14-25. See Vogt 2002, § IV.

¹⁹ It is true that a distinction between theory and its applications seems to be made at the start of §3 with the words "we must try and refer to these (general principles) the reasons from which the particular occurrences come about concerning which people are perplexed"; and to this one may compare *On Fire*, which has 76 sections and where §10 begins "so, dismissing the previous larger questions, we should try to speak about the lesser ones". But the immediate sequel shows that the remark at the start of §3 in our treatise is concerned only with the examples immediately following in §§4-6. (I owe this insight to Sabine Vogt.)

²⁰ Above, p. 174. That the discussion in §§11-12 is to be connected with the theory put forward in §1 is shown by the fact that it is not until §11 that the reference in §1 to the effects of nourishment is taken up.

criticised for reducing disparate phenomena too much to a single pattern.²¹

This essay was however, like others of Theophrastus' works,²² a good quarry for the compilers of the pseudo-Aristotelian *Problems*, as a glance at the apparatus of parallels will show. One may have some sympathy with de Baillou's judgement (p. 271) that Theophrastus did not examine the causes of dizziness thoroughly, and certainly not in a way that would assist the doctor trying to find remedies; Theophrastus' concern was not medical whereas de Baillou's explicitly is, but even so there is some justice in de Baillou's complaint that Theophrastus spends time on trivial questions (*quaestiunculae*)—and, one may add, on the explanation of alleged facts whose reality seems dubious, such as that people running in circles get more dizzy if they are tall or run anti-clockwise.²³

Material from the present essay also found its way into the later collection of problems which appears in differing forms in different MSS, sometimes attributed to Alexander of Aphrodisias but sometimes in part to Aristotle, though it is certainly not the work of Aristotle and almost certainly has nothing to do with Alexander either.²⁴ There are also parallels, not mentioning Theophrastus by name, in the medical tradition: in Archigenes (early second century A.D.), cited by the later compiler Aëtius Amidenus, and in Galen, later in the second century, who also himself cites Archigenes in the context.²⁵ There was a treatise *On*

²¹ Above, n. 11.

²² The fact that a work could be used in this way is not however in itself any guide to its own character. Cf. Sharples 1995, p. 32 n. 84 and p. 38 n. 122, and Vogt 2002, § I. One may note that the tendency of Photius' summaries to concentrate on the parts of Theophrastus' *opuscula* that are most amenable to casting in "problem" form leads to less unevenness in his treatment of *On Dizziness* than of either *On Sweats* or *On Fatigue*; cf. Sharples 1988, p. 82.

²³ See further below, commentary on 3.22-24, 6.44-47.

²⁴ Cf. Ideler 1841, pp. 3-80; Usener 1859; Bussemaker 1857. To avoid confusion with the [Aristotle] *Problems* in Bekker I shall refer to this collection as "*Problemata inedita*", even though that title is strictly correct only in the context of the attribution of part of the material to Aristotle. Cf. Richter 1885, pp. 30, 40; Sharples 1987, p. 1198, and references there; Sharples 1998, 388-393. Vogt has pointed out that the problems taken from our treatise are the only ones concerned with dizziness in this collection.—Richter 1885, p. 46, suggests that the inclusion in the two collections of "Aristotelian" *Problems* of only some of the problems that could be extracted from Theophrastus' text suggests that there was once a fuller collection of such problems from which we have only excerpts; the inference is possible but cannot be proved.

²⁵ Galen, *De locis affectis* 3 vol.8 p. 203.13ff. Kühn, for the distinction between cases

Dizziness and (cases of) Giddiness, Περὶ ἰλίγγου καὶ σκοτώσεων, by Strato, Theophrastus' successor as head of the Lyceum.²⁶

3) This Edition

Fortenbaugh's detailed introduction to his edition of Theophrastus, *On Sweats* removes the need for lengthy discussion here; I have followed similar principles. MSS other than the primary MS A are not usually cited where they confirm its correct reading, or where they are in obvious error (e.g. ἐπὶ for ἐπεὶ B¹H at 51: Burnikel p. 27). Sigla are those of the edition of Theophrastus' *Metaphysics* by Laks and Most. Printed editions are cited selectively; the first edition to adopt a reading has been cited but subsequent ones generally not, though on occasion discussion of subsequent editions will be found in the Commentary.

MS B is of particular importance as the source for the Aldine *editio princeps*, this ensuring its influence on later editions.²⁷ Burnikel 15-34, followed by Laks-Most xlv, lxv, lxvii distinguishes two stages of corrections in B, a first series made before S was copied from it and a second made after the copying of S but before the copying of Ald. I have therefore used B² for corrections in B that are reproduced in S and in Ald. (e.g. at *On Dizziness* 17 and 44), B³ for those reproduced in Ald. but not in S (e.g. at *On Dizziness* 14).

It should be noted, however, that there are places where corrections in B are followed by *neither* S or Ald. (e.g. 6, 31, 40, 41, 42, 46, 47, 62, 66 below), and indeed in *On Dizziness* at least this is more common than corrections followed by S and Ald. or by Ald. alone. Sometimes it might be conscious decision on the part of S or Ald. to ignore such a correction; sometimes however the corrections in B are—and, one would have thought, should also have seemed—clearly right, and the text before correction simply wrong (40 is a particularly clear example). It seems difficult therefore to rule out that corrections in B may have been

of dizziness starting from the head and those arising from the stomach.

²⁶ fr.103 Wehrli. The Anonymus Parisinus 17.1 (p. 110.4ff. Garofalo 1997; below, commentary on 1.2-4) notes that “the ancients” did not give a direct cause for dizziness, in a passage which van der Eijk 2000, p. 155 identifies as a reference to Diocles. There is a connection between the areas of interest of Diocles and Theophrastus also with regard to sweat, which the former regarded as unnatural (frr. 30a-d van der Eijk).

²⁷ See below, p. 180.

disregarded through mere inadvertence; and in that case it seems at least questionable whether we can still argue that a correction in B reproduced in Ald. but not in S cannot have been made until after S was copied. Moreover, there are also clear signs of the scribe of S exercising his own independent judgement (e.g. 33, 39 below); and for this reason too I do not think we can assume that wherever a correction in B is followed in Ald. but not in S that is because it had not been made at the time S was copied from B. It may have been there already but S chose to ignore it. Nor would I be happy to assert that S and even the correctors of B might not already have been drawing on Photius; see below on 33 and 30-32 respectively.

Photius' paraphrase has been cited in the apparatus to the text of Theophrastus, simply as "Phot." where he is following Theophrastus so closely that he may be regarded as a direct witness for the text, but with "cf. Phot." where it is rather a question of his paraphrase providing support for one reading rather than another. However, because Photius was paraphrasing rather than transcribing Theophrastus' text, the first edition of Theophrastus' work itself to incorporate each reading from Photius has also been cited.

The translation by Gregorius Tiphernas was probably made between 1453 and 1455; for the date, and for biographical details, the discussion by Charles Schmitt should be consulted.²⁸ For Theophrastus' *Metaphysics* Laks and Most conclude that Tiphernas' translation is entirely dependent on A, and indeed that corrections in A are Tiphernas' own.²⁹ In our text there are certain places (15, 26-27, 30, 63, 67) where Tiphernas' version corresponds to Photius' paraphrase rather than to A, and others (17, 29(?), 31, 39, 44, 49) where he anticipates later emendations; but there is no sign of wholesale transfer of material from Photius into his translation, and, more significantly, there are also places (10(?), 34, 46, 75, 96) where he has not followed Photius even though the latter offers a manifestly superior text. (Such cases have been noted in the apparatus to exemplify Tiphernas' dependence on A: where he is not cited it may be assumed either that he follows A or that his translation is too free to allow us to decide between readings.)

Many of the emendations of Grangerius, which have been fundamental for resolving problems in the text of our treatise, are

²⁸ Schmitt 1971, pp. 280-281, 296-297.

²⁹ Laks and Most 1993, p. lxxvii.

attributed by him to the edition by Stephanus. Stephanus (Estienne), however, in his collection of previously unpublished Theophrastean texts including *On Dizziness*,³⁰ was simply printing Photius' paraphrases in sequence. He was not in any sense attempting to edit *On Dizziness* as preserved in the MSS rather than in Photius. Accordingly the credit (or in some cases arguably the blame) for emending the MSS text from Photius is due to Grangerius rather than to Stephanus, and has been so assigned in the apparatus.³¹ De Baillou³² reprints Grangerius' text and translation with his own commentary.

For the editions of Furlanus and of Schneider, the editor's name given on its own indicates a reference to the printed text (in the case of Schneider, vol.1); references to their commentaries are given with page and, in the case of Schneider, volume numbers. I have consulted A, B, S and Grangerius by means of photographs, and direct inspection in the case of S; Tiphernas in a transcript for which I am grateful to Michael Sollenberger; Ald. and the other printed editions apart from Grangerius by direct inspection. Other readings are reported from Schneider's commentary or from Burnikel; and for information on some modern conjectures I am indebted to the 1996 article of Mouraviev. The 1541 Basel edition has not been cited because it is simply a reprint of Ald.³³ Reports of variants in Photius' own text are from Henry's apparatus. References to [Aristotle], *Problemata* 1-38 (cols. 859a-967b Bekker) are given in full to avoid confusion with [Aristotle], *Problemata inedita* = [Alexander of Aphrodisias], *Problemata* 3-4 (above, n. 24).

In matters of orthography I have followed A rather than the editorial tradition (for example at 9, where Heinsius, Schneider and Wimmer followed Furlanus' οὐδὲν rather than οὐθὲν of A, all other MSS I have consulted, the Aldine and Grangerius, or at 67 where B's ἀλλ', against ἀλλὰ of AVaRVz, has influenced the entire subsequent editorial tradition.)³⁴

³⁰ Stephanus 1557. *On Dizziness* is at pp. 49-51.

³¹ Schmitt 1971, p. 297 indeed suggests that Grangerius' preface indicates that he was relying *entirely* on Stephanus as his source for the Greek text; but in fact he speaks (ibid. 298) of being assisted in his edition by *comparing* Stephanus' edition and the [Aristotle] *Problems*.

³² See the Bibliography. I am grateful to Michael Sollenberger for references to the various editions of this work.

³³ It is sometimes cited by Schneider, but in *On Dizziness* always as agreeing with Ald.

³⁴ Similarly at 85 B's δὲ rather than A's δ' has been followed by S, Heinsius, Schneider and Wimmer, though not by Grangerius or Furlanus.

SIGLA

codex ex quo alii pendent

A = Vaticanus gr. 1302 (A Wimmer: no.16 Burnikel), saec. xiv ineunte

codices alii qui in hac editione citantur

B = Bernensis 402 (no.19 Burnikel), circa A.D. 1480

B² = B corr. et S et Ald. consentientes

B³ = B corr. et Ald. sed non S

D = Milan, Ambrosianus P 80 sup. (no. 14 Burnikel), ante A.D. 1427

H = Leidensis Vossianus gr. Q 25 (no. 18 Burnikel), A.D. 1487

M = Marcianus gr. 260 (no.12 Burnikel), A.D. 1442-1457

N = Neopolitanus III D 1 (no.25 Burnikel), A.D. 1497

O = Vaticanus Ottobonianus gr. 153 (no.24 Burnikel), A.D. 1450-1475

R = Vaticanus Palatinus graecus 162 (no.13 Burnikel), A.D. 1442-1457

S = Londinienis, BL Add. 5113 (no.15 Burnikel), A.D. 1480-1487

V = Vaticanus graecus 1305 (no. 30 Burnikel), A.D. 1450-1500

V^a = Vaticanus Urbinas gr. 108 (no. 17 Burnikel), brevi ante A.D. 1427

z = Parisinus graecus 2277 (Q Wimmer: no.23 Burnikel), c. A.D. 1479

translatio vetus

Tiph. = translatio Latina a Gregorio Tiphernate confecta, Vaticanus Urbinas lat. 208, c. A.D. 1453-1455

editio princeps

Ald. = Editio Aldina (no.22 Burnikel), A.D. 1497

aliae editiones et adnotationes ad textum

Ball. = Guillaume de Baillou (Gulielmus Ballonius), *Commentarius in libellum Theophrasti de vertigine* [Paris: Jac. Quesuel, 1640], reprinted in de Baillou, *Opera Omnia Medica* (Venice: Angelus Jeremia, 1734, vol.1 pp. 267-298).

van der Ben = N. van der Ben, "Theophrastus De vertigine 9 and Heraclitus fr.125," *American Journal of Philology*, vol. 109 (1988) pp. 397-401.

Bernays = J. Bernays, *Heraclitea* (diss. Bonn, 1848) pp. 6-7 = Bernays, *Gesammelte Abhandlungen*, I. (Berlin: W. Hertz, 1885), p. 6.

Burn. = W. Burnikel, *Textgeschichtliche Untersuchungen zu neun Opuscula Theophrasts* (Wiesbaden: Steiner, 1974).

Bussemaker = U.C Bussemaker, *Aristoteles: Opera Omnia*, vol. 4.1 (Paris: Didot, 1857).

- Forst.¹ = E. Forster, "Some Emendations in the Fragments of Theophrastus," *Classical Quarterly* vol. 21 (1927) pp. 166-168.
- Forst.² = E. Forster, "Further Emendations in Theophrastus," *Classical Quarterly* vol. 27 (1933) pp. 140-141.
- Furl. = D. Furlanus, *Editio et translatio cum commentariis operum omnium Theophrasti*. (Hannover: Claudius Marnius, 1605).
- Grang. = B. Grangerius, *Theophrasti philosophi De sudoribus libellus unus; De vertigine libellus alter; e Graeci lingua in Latinam conversi et annotationibus illustrati*. (Paris: Ioannes de Bordeaulx 1576).
- Heinsius = D. Heinsius, *Theophrasti Eresii Opera Omnia*. (Leiden: Henricus ab Haestens, 1613).
- Lassalle = F. Lassalle, *Die Philosophie des Herakleitos des Dunklen von Ephesos*. (Berlin: Duncker, 1858).
- Mackenzie = M.M. Mackenzie, "The Moving Posset stands still: Heraclitus fr.125," *American Journal of Philology* vol. 107 (1986) pp. 542-551.
- Marcovich = M. Marcovich, *Heraclitus, Editio Maior* (Merida: Los Andes University Press, 1987); *Eraclito, Frammenti* (Florence: Nuova Italia, 1978).
- Mouraviev REG = S.N. Mouraviev, "Marginalia Heraclitea," *Revue des Études grecques* 98 (1985) 129-132.
- Mouraviev = S.N. Mouraviev, "The Moving Posset Once Again: Heraclitus fr. B 125 in context," *Classical Quarterly* vol. 46 (1996) pp. 34-43.
- Phot. = Photius, *Bibliotheca* 278 526a32-527a3 = Photius, *Bibliothèque*, vol. 8, ed. R. Henry (Paris: Les Belles Lettres, 1977) pp. 160.16-163.2.
- Richter = E. Richter, *De Aristotelis Problematis* (diss. Bonn, 1885).
- Roussos = E. N. Roussos, *Herakleitos: Peri physeos*. (Athens: Papademas, second ed., 1987).
- Schneider = J.G. Schneider, *Theophrasti Eresii quae supersunt opera et excerpta librorum*, vols. 1-5. (Leipzig: Teubner, 1818-1821).
- Usener = H. Usener, *Alexandri Aphrodisiensis quae feruntur Problematorum libri 3 et 4*. (Berlin: Academia regia, 1859).
- Vogt = S. Vogt, "Theophrast, *De vertigine*," in *On the Opuscula of Theophrastus*, eds. W.W. Fortenbaugh and G. Woehrle = *Philosophie der Antike*, Band 14 (Stuttgart: Franz Steiner, 2002), pp. 141-162.
- White = S.A. White (private communications)
- White 2002 = S.A. White, "Opuscula and Opera in the Catalogue of Theophrastus' Works", in *On the Opuscula of Theophrastus*, eds. W.W. Fortenbaugh and G. Woehrle = *Philosophie der Antike*, Band 14 (Stuttgart: Franz Steiner, 2002), pp. 9-37.
- Wimm.¹ = F. Wimmer, *Theophrasti Eresii opera quae supersunt omnia*, vol. 3. (Leipzig: Teubner, 1862).
- Wimm.² = F. Wimmer, *Theophrasti Eresii opera quae supersunt omnia*. (Paris: Didot, 1866).
- Wimm. = Wimm.¹ et Wimm.²

Θεοφράστου Περὶ ἰλίγγων

1 οἱ ἰλίγγοι γίνονται ὅταν ἡ πνεῦμα ἀλλότριον περὶ τὴν
κεφαλὴν ἔλθῃ ἡ ὑγρότης περιττωματικὴ [ἡ] ἀπὸ τροφῆς ἐνίας,
οἶον ἡ τοῦ οἴνου ἡ καὶ ἄλλου τινὸς χυλοῦ, ἡ τρίτον ὅταν κινῇ
τις κύκλῳ τὴν κεφαλὴν· ὁ γὰρ τόπος ὁ περὶ τὸν ἐγκέφαλον 5
φύσει μὲν ὑγρὸς ἐστίν, ὅταν δ' ἔλθῃ τι πλεόν ἀλλότριον
βιάζεται διαδυόμενον πρὸς τὰς φλέβας <καὶ> ὥθει κύκλῳ τὸ
ὑπάρχον ὑγρὸν, ὥστε τρόπον τινὰ τὸ αὐτὸ συμβαίνει καὶ ἐάν
τις προαιρέσει κύκλῳ κινῇ τὴν κεφαλὴν. οὐθὲν γὰρ διαφέρει
ἔξωθεν ἢ ἔσωθεν εἶναι τὸ κινεῖν. οὔσης <δὲ> οἶον δίνης τινὸς 10
τῆς φορᾶς <καὶ> τοῦ ὑγροῦ μὴ συνεχοῦς ὄντος ἀλλ' ἐν τῇ
κινήσει τοῦ μὲν ὑστεροῦντος τοῦ δὲ προτεροῦντος τὸ
ὑφιστάμενον ἀντικροῦν ἴστησι, τὸ δ' ἰστάμενον διὰ τὸ μὴ
ἰσορροπεῖν ὁμοίως αὐτῇ ἢ ἂν ῥέῃ ταύτῃ φέρεται καὶ τὸν
ἰλίγγον ποιεῖ καὶ καταβάλλει πολλάκις. 15

1 *Phot.* 278 526a30 (*CB* t.8 p.160.16): ἐκ τοῦ περὶ ἰλίγγων. 2-8 *ibid.* 526a33-40 (*CB* t.8 p.160.17-24): ὅτι οἱ ἰλίγγοι γίνονται ὅταν πνεῦμα ἀλλότριον εἰς τὴν κεφαλὴν ἔλθῃ ἡ ὑγρότης περιττωματικὴ, ἡ ἀπὸ τίνος τροφῆς, ὡς ἀπὸ τοῦ οἴνου, ἡ ἀπὸ τίνος ἄλλου χυμοῦ· ἔτι δὲ καὶ ὅταν τις κινῇ τὴν κεφαλὴν κύκλῳ. ὁ γὰρ τόπος ὁ περὶ τὸν ἐγκέφαλον ὑγρὸς ὢν, ὅταν δέξηται τι πλεόν ἀλλότριον, τὸ δὲ βιάζεται διαδυόμενον πρὸς τὰς φλέβας, ὥθει κύκλῳ τὸ προὑπάρχον ὑγρὸν. 10-15 *ibid.* 526a40-b3 (*CB* p.160.24-7): οὔσης δὲ οἶον δίνης τῆς φορᾶς, καὶ τοῦ ὑγροῦ μὴ συνεχοῦς, ἀλλ' ἐν τῇ κινήσει τοῦ (*M*: τὸ *A*) μὲν προλαμβάνοντος (*A*: προσ- *A*²*M*), τοῦ δὲ ὑστεροῦντος διὰ τὸ μὴ ἰσορροπεῖν ὁμοίως, τὸν ἰλίγγον ποιεῖ καὶ καταβάλλει πολλάκις.

2-3 *cf. Archigenem ap. Aëtium Amidenum, Iatrica* 6.7.1-3; *Anonymum Parisinum* 17.1 p.110.6-7 *Garofalo* 2-10 *Galenus, De locis affectis* 3 t.8 p.202.11-203.8 *Kühn*

1 Περὶ ἰλίγγων καὶ σκοτώσεων *Diog. Laert.* 5.44 2 ἡ] ἡ *Wimm.*², *sed supervacuo, cf. adnot.* περὶ *A*: εἰς *Phot. Schneider: ἐπὶ temptavit Furl.* p.261 3 ἔλθῃ *A Phot.: om. Ald.* post περιττωματικὴ *lacunam* 4-6 *litt. indicant codices plerique, Ald.: non tamen A qui tamen ante ἡ exhibit αἱ vel ἅ ἡ A Ald. Phot.: om.. V^oRz (Burn. p.65), del. Wimm.*²: ἡ *Grang. (sed sive in transl.)* 4 post οἶον *lacunam statuerunt Schneider, Wimm.*¹ 5 τις] τι *Ald.* 6 πλεόν *A Ald. Phot.: πνεῦμα B mg., Grang.* 7 καὶ *add. Schneider: ante πρὸς add. Ald.* 8 ὑπάρχον *A Ald.: προὑπάρχον Phot., Schneider vol.4 p.770* 9 οὐθὲν *A Ald.: οὐδὲν Furl.* 10 ἡ (*corr. ex εἰ?*) *ante ἔξωθεν exh. B: εἰ HS*

→

Theophrastus, On Dizziness

- 1 (Cases of) dizziness come about when either (i) an alien breath or (ii) a fluidity from residue³⁵ moves around the head, from certain types of nourishment, for example either (from) wine or (from) some other juice, or thirdly (iii) when someone moves his head (round) in a circle. For the region around the brain is fluid by nature, and whenever some alien excess enters into it, it forces its way in, percolating to the vessels, and drives the fluid that is there in a circle, so that in a way the same happens as when someone deliberately moves his head in a circle. For it makes no difference whether the origin of movement is external or internal. The movement being like some whirlpool, and the fluid not being continuous, but part being behind in the movement and part in advance, what settles strikes against (what is moving) and brings it to a halt; and what is brought to a halt, because it is not in equilibrium in the same way as (what is moving), is carried in whatever direction (what is moving) flows, and produces the dizziness, and often throws (people) to the ground.

1 *Phot.* 278 526a30 (*CB t.8 p.160.16*): From the (work) *On Dizziness*. 2-8 *ibid.* 278 526a33-40 (*CB t.8 p.160.17-24*): (I read) that (cases of) dizziness come about when an alien breath (pneuma) comes into the head, or a fluidity from residue, either from some food, for example from wine, or from some other juice; and also when someone moves his head (round) in a circle. For the region around the brain is fluid by nature, and when it receives some alien excess and this forces its way in, percolating to the veins, it drives the fluid that was there before in a circle. 10-15 *ibid.* 526a40-b3 (*CB p.160.24-7*): The movement being like some whirlpool, and the fluid not being uniformly continuous, but part being in advance in the movement and part behind, because of the lack of equilibrium produces the dizziness, and often throws (people) to the ground.

³⁵ I.e. the remains of digested nourishment.

δὲ *add. Schneider vol.4 p.771 ex Phot.* δίνης *Ald. Phot.*: δινῆς *A ut vid. (cf. Burn. p.86) BS*: δεινῆς *DRz (cf. ibid.) Tiph.?*: *Vⁿ legi non potest* 11 καὶ *add. Wimm. ex Phot.* ὄντος *White*: ὁμοίως *A Ald.* 13 ἀντικροῦον *Ald.*: ἀντικρύων *A* 14 αὐτῇ *B³ in marg., Ald.*: αὐτῇ *A (ex corr.?) B*: αὐτῇ *Tiph.?*: αὐτῷ *vel αὐτῷ Schneider vol.4 p.771* ῥέη *A*: ῥέπη *Wimm.* 15 καταβάλλει *Phot. Grang.*: deicit *Tiph.*: κατα*α*ει *A*: κατὰπο*, *et po del., z: post κατα lacunam exhibent DVⁿRBHS Ald. de loco cf. Burn. p.86* 17 δινεῖσθαι *B² in marg., Ald.*: circumtornari *Tiph.*:

- 2 αἴτιον δὲ τοῦ μὴ δύνασθαι τὰ ὑγρά ῥαδίως στρέφεσθαι καὶ
 δινεῖσθαι διὰ τὴν λεχθεῖσαν αἰτίαν, ὅτι οὐ συνεχῇ παραπλή-
 σιον γὰρ τὸ συμβαῖνον ὥσπερ ἐν τοῖς ὠοῖς τοῖς ὠμοῖς· οὐδὲ
 γὰρ ταῦτα δύναται δινεῖσθαι διὰ τὴν ὑγρότητα, τὰ δ' ἐφθὰ
 δύναται διὰ τὸ μὴ ἔχειν τὸ σφάλλον ὑφιστάμενον ἐνὸς ὄντος 20
 καὶ συνεχοῦς <τοῦ ἐντός>.
- 3 αἱ μὲν οὖν αἰτίαι σχεδὸν αὗται καὶ τοιαῦται τοῦ πάθους.
 ἀφ' ὧν δὲ συμβαίνει γίνεσθαι τὰ καθ' ἕκαστα περὶ ὧν
 ἀποροῦσι πρὸς ταῦτα ἀνάγειν πειρατέον. οἶον διότι κύκλω
 περιπατοῦντες ἰλιγγιῶσι καὶ ἔτι μᾶλλον [καὶ] ὅσῳ ἂν ἐλάττω 25
 κύκλον, κἂν θᾶττον θέωσι σφοδρότερον· κἂν μετὰ πολλῶν ἢ
 μόνοι, καὶ ἐπ' ἀρίστερα θέοντες μᾶλλον, καὶ οἱ μακρότατοι δὲ
 μάλιστα. πάντων γὰρ τούτων καὶ εἴ τι ἄλλο τοιοῦτον ἐν τοῖς
 πρότερον εἰρημένους αἱ αἰτίαι.
- 4 εἴπερ γὰρ ὁ ἱλιγγος γίνεται εἴ <τις> ἐν τῷ αὐτῷ στρέφοιτο 30
 τάχιστ' ἂν καὶ μάλιστα τῶν λοιπῶν ἰλιγγιῇ ὁ ἐγγυτάτῳ ἢ ὁ

18-21 *Phot.* 278 526b3-7 (*CB* t.8 p.160.28-161.3): ὅτι τὰ ὠμὰ ὠὰ διὰ τοῦτο οὐ
 δινεῖται ὥσπερ τὰ ἐφθὰ (*A*: περιδινεῖται, *om.* ὦ. τ. ἐ., *M*), διότι τὰ μὲν ὑπὸ
 τῆς (*A*: *om.* *M*) ὑγρότητος ἀνωμάλου καὶ οὐκ ἰσορρόπου οὔσης σφάλλεται,
 τὰ δὲ (*codd.*: τὰ δ' οὐ *Schn.*), διὰ τὸ μὴ ἔχειν τὸ σφάλλον ὑφιστάμενον ἐνὸς
 ὄντος καὶ συνεχοῦς τοῦ ἐντός. 22-34 *ibid.* 526b7-20 (*CB* p.161.3-16): ἐκ δὲ
 τῆς αὐτῆς θεωρίας ἐπιλύεται καὶ τὸ διὰ τί κύκλω περιπατοῦντες ἰλιγγιῶσι,
 καὶ ὅτι μᾶλλον ἐὰν ἐν ἐλάττονι κύκλω, καὶ ἔτι ἐὰν θᾶττον θέωσι, καὶ ὅτι,
 εἰ μετὰ πολλῶν, μᾶλλον ἢ μόνοι, καὶ διὰ τί ἐπ' ἀριστερᾶς θέοντες μᾶλλον ἢ
 ἐπὶ δεξιᾶ. πάντων γὰρ τούτων καὶ τῶν ὁμοίων προεῖρηται ἡ αἰτία. εἰ γὰρ ὁ
 ἱλιγγος γίνεται, ἐὰν τις ἐν τῷ αὐτῷ στρέφῃ τὴν κεφαλὴν, δῆλον ὡς εἴ τις
 ἐγγὺς τοῦτου στρέφοιτο, τάχιστα καὶ μάλιστα τῶν ἄλλων ἰλιγγιῇ. ἐγ-
 γυτάτῳ δὲ ὁ ἐν ἐλάττονι κύκλω στρέφων τὴν κεφαλὴν· καὶ ὅσον ἂν θᾶττον,
 μᾶλλον. διόπερ καὶ οἱ θέοντες τῶν περιπατούντων μᾶλλον ἰλιγγιῶσι, καὶ οἱ

17-21 [*Aristoteles*], *Problemata* 6.4 885b37-8; *id.* 2.49 (p.301.1-9 *Bussemaker*) =
 [*Alexander Aphrodisiensis*], *Problemata* 4.49 *Usener*

διανο|νεῖσθαι, *v ante* εἶσθαι *in marg.*, *A*: διανοεῖσθαι *V^aRB¹Hz* 17-
 19 δινεῖσθαι — δύναται *om.* z 19 *post* ὑγρότητα *add.* σφάλλεσθαι *Grang.*
 35 *ex Phot.* (*sed om. in transl.*) ἐφθὰ, ἐ *puncto notatum*, *A*: ἐφθὰ *Ald.*
 20 *post* δύναται *ex Phot. suppl.* διότι τὰ μὲν ὑπὸ ὑγρότητος ἀνωμάλου καὶ
 οὐκ ἰσορρόπου οὔσης σφάλλεται τὰ δ' οὐ *Furl.* (257, *sed cf. etiam* 262) τὸ
 σφάλλον <τὸ> ὑφιστάμενον *coni. Schneider vol. 4 p.772.* 21 τοῦ ἐντός
suppl. ex Phot. Furl. in adnotatione (262) *sed non in textu: omisit Heins.:*
respuit White 23 τὰ *Phot. Grang.*: τοῖς *A Ald.* 25 ἔτι] ὅτι *coni. Schneider*
vol.4 p.773 ex Phot. καὶ *secl. Schneider* 26 κἂν (*pr.*) *Furl.*: καὶ *A Ald.*

- 2 The reason why fluid things cannot easily be spun and whirled, for the reason that has been stated, is that they are not continuous. What happens is similar to what happens with raw eggs; for these cannot be spun, because of the fluidity, but boiled (eggs can), because they do not have anything that settles down and overturns them, their interior being single and continuous.
- 3 Well, these and similar ones are more or less the reasons for the experience. We must try to refer the particular occurrences, concerning which people are perplexed, to the reasons for which they happen to come about. For example, why do people who walk round in a circle become dizzy, and the more so the smaller the circle is, and more intensely if they run faster? And (more) with many people than on their own, and more if they run turning to the left?³⁶ And the tallest people most. All these things and anything else like them have their reason in what was said before.
- 4 For if dizziness comes about if someone turns around in the same place, it is clear that that person will become dizzy most quickly, and

18-21 *Phot.* 278 526b3-7 (*CB t.8 p.160.28-161.3*): (I read) that for this reason raw eggs cannot be rotated like boiled (ones), because the former are overturned by the fluidity that is not uniform and not in equilibrium, while the latter are not because they do not have anything that settles down and overturns them, their interior being single and continuous. 22-34 *ibid.* 526b7-20 (*CB p.161.3-16*) From the same consideration are also solved (the problems) why people who walk round in a circle become dizzy, and that (they do so more) in a smaller circle is, and moreover if they run faster, and that (they do so) more with many people than on their own, and why (they do so) more if they run turning to the left than to the right The reason for all these things and anything else like them has been stated before. For if dizziness comes about if someone turns his head around in the same place, it is clear that, if

³⁶ i.e. counter-clockwise.

καὶ ἔτι *vel* καὶ ὅτι ἂν (*cf. Phot.*) *Schneider vol.4 p.773*: καὶ θᾶπτον *om. Grang.* 26-27 ἢ μόνοι *Phot. Grang.*: q(uam) soli *Tiph.*: ἢ μόνον *A*: ἢ μόνον *punctis annotavit S*: ἢ μόνον *Ald.* 27 *post μάλλον suppl.* ἢ ἐπὶ δεξιά *Grang. (cf. Phot.)* 29 πρότερον] ὕστερον *Grang.* αἱ αἰτίαι *Wimm.*¹ p.xxv, *Wimm.*² (*cf. Phot.*): αἰτιάται *A Ald.*: causae constitutae sunt *Tiph.*: ἡ αἰτία εἴρηται *temptavit Furl. in adnotatione (263)* 30 εἴ <τις> *Wimm.*: si quis *Tiph.*: ἔάν *A*: ἔάν *Ald.*: ἔάν τις *Phot. Grang.* *post αὐτῷ e Phot.* <στρέφη τὴν κεφαλὴν, δῆλον ὡς εἴ τις ἐγγὺς τοῦτου> *in textum receperunt Grang. Schneider Burn.* 31 ἰλιγγιῶν ὁ ἐγγυτάτω ἢ ὁ *Furl.*: ἰλιγγιῶν ἢ ἐγγυτάτω ἢ ὁ *A*: ἰλιγγιῶν ἢ ἐγγιῶν ἢ ἐγγυτάτω ἢ ὁ *H*: ἰλιγγιῶν ἢ ἐγγυτάτω ἢ ὁ *B* *S Ald. cett. (lac. indic. in marg. R)*: ἰλιγγιῶν ὁ *B in marg. (cf. Phot.)*: ἰλιγγιῶν, ἐγγυτάτω δὲ ὁ *Grang.*: ἰλιγγιῶν ὁ [ἐγγυτάτω ἢ ὁ]

- ἐν ἐλάττονι κύκλῳ στρέφων, καὶ ὅσῳ ἂν θᾶττον μᾶλλον.
 διόπερ <καὶ> οἱ θεόντες τῶν περιπατούντων καὶ οἱ ταχέως
 τῶν βραδέως· θεοῦσι γὰρ [οἱ] <ἐγκεκλικότες> πρὸς τὸ κέντρον· 35
 5 συνάπτειν καὶ γίνεσθαι κῶνον βάσιν δ' εἶναι τὸν κύκλον. διὸ
 συμβαίνει καθάπερ ἐν τῷ αὐτῷ στρέφειν τὴν κεφαλὴν, καὶ
 ὅσῳ ἂν ἐλάττω κύκλον μᾶλλον, ὁξύτερος γὰρ ὁ κῶνος, καὶ
 ἐὰν θᾶττον πλεονάκεις ἐν τῷ αὐτῷ γίνεσθαι κατὰ τὸν ἴσον
 χρόνον· καὶ τοῖς μακροτέροις δὲ μᾶλλον ὅσῳ ἐγκλίνουσιν· 40
 ἐγγυτέρῳ γὰρ ἔχει τὴν κεφαλὴν ὁ μείζων τῆς τοῦ κῶνου
 κορυφῆς. διὸ σχεδὸν ὥσπερ ἐν τῷ αὐτῷ συμβαίνει ἔσω ἔχοντα
 τὴν κεφαλὴν· οὕτω δὲ μάλιστα ὁ ἱλιγγος.
 6 καὶ <οἱ> εἰς τὰ ἀρίστερα θεόντες ἔτι μᾶλλον ἔσω νεύουσι
 καὶ ὁξυτέραν ποιοῦσι γωνίαν πρὸς τὸν κύκλον· ἐμβριθέστερα 45
 γὰρ ὄντα τὰ δεξιὰ προσαποβιάζεται μᾶλλον ἐντὸς διὰ τὴν
 ἀσθένειαν τῶν ἀριστερῶν. καὶ ἐὰν [μὴ] μετὰ πολλῶν θέωσι
 μᾶλλον καὶ θᾶττον ἢ μόνοι· πρὸς γὰρ τῇ κύκλῳ περιφορᾷ καὶ

ταχέως τῶν βραδέως· θεοῦσι γὰρ ἐγκεκλικότες πρὸς τὸ κέντρον [μᾶλλον ἱλιγγιώσι]. 44-60 *Phot.* 278 526b21-34 (*CB* i.8 p.161.7-31): οἱ δὲ ἐπ' ἀριστερᾷ θεόντες τῶν ἐπὶ τὰ (*A*: *om.* *M*) δεξιὰ μᾶλλον, διότι ὁξυτέραν γωνίαν ποιοῦσι πρὸς τὸν κύκλον· ἐμβριθέστερα γὰρ ὄντα τὰ δεξιὰ προσβιάζεται μᾶλλον ἐντὸς διὰ τὴν ἀσθένειαν τῶν ἀριστερῶν. καὶ εἰ μετὰ πολλῶν θέουσι, μᾶλλον ἢ μόνοι, διότι πρὸς τῇ κύκλῳ περιφορᾷ καὶ ἡ ὄψις προσβάλλουσα τοῖς θεοῦσι (*A*²*M*: θεσῶι *A*), μὴ συνεχῆς οὖσα, ποιεῖ τινα κίνησιν ἐν τῷ ἐγκεφάλῳ καὶ ταραχὴν· διὸ (*A*: διότι *M*) ἱλιγγιώσι μᾶλλον

47-50 [*Aristoteles*], *Problemata inedita* 2.39 (p.299.2-4 *Bussemaker*) = [*Alexander Aphrodisiensis*], *Problemata* 4.39 *Usener*

Burn., *similiter Tiph.* 32 *post* στρέφων *add.* τὴν κεφαλὴν *Schneider ex Phot.* 33 καὶ *add.* *Schneider ex Phot.*: διὸ καὶ *pro* διόπερ *exhib.* *S* *post* θεόντες *add.* μᾶλλον ἱλιγγιώσι *Schneider ex Phot.* 34 οἱ *del.* *Grang.*: *om.* *Phot.*: *exhib.* *A* *Tiph.* *Ald.*: *ante* οἱ *inserendum* πλυκεῖμενος (*π supra λ scriptum*) *in marg. indicat R*: ἐκπίπτει πρὸς μίαν οἱ *deletum exhib.* *V* *post* οἱ *lacunam indicant A Ald.*: <ἐγκεκλικότες> *add.* *Grang. ex Phot.* 36 διὸ *A*: διόπερ *Wimm.* 38 κύκλον *A*: κύκλῳ *V*: κύκλων *corr. in* κύκλον *B*: κύκλων *Ald.* 39 τῷ αὐτῷ *coni. Schn. vol.4 p.773, accepit Wimm.*: *in eodem Tiph.*: τοῦτῳ *A* ἴσον *S Grang.*: ἴσον *A Ald.* 40 μακροτέροις] μαλακωτέροις *Ald.* ἐγκλίνουσιν *B in marg.*: ἐγκλείουσι *A Tiph. Ald.* 41 ἔχει *Grang.*: ἔχειν *A Ald.* ὁ *B in marg.*: οὐ *A Tiph. Ald.* του *add A*² *supra lineam*: *om.* *A*¹ 41-42 κόνου κώρυφῆς *sic Ald.* 42 ἔσω *coni. Schneider vol.4 p.774*: εἰσιν *A*: εἰσὶν *Ald.*: ἴσιν *B in marg. V*^o: *del. Schneider in textu, Wimm.* 44 οἱ *Ald. Phot.*: *om.* *A*

more than the rest, who turns closest or in a smaller circle, and the more so the faster (he does it). And for this reason those who run, too, (become more dizzy) than those who walk, and those who do so swiftly than those who do so slowly. For they run leaning towards the centre. So when their heights are extended in straight lines they join together in a single vertex and a cone is formed of which the circle is
 5 the base. And for this reason it comes about that they turn their head as it were in the same place, and the more so the smaller the circle, for the cone is more acute, and if (they run) faster they are in the same place more often in an equal time. Taller people (turn their head) more (in the same place) inasmuch as they lean; for the taller person has his head closer to the vertex of the cone. And for this reason it comes about that he almost as it were (turns) in the same place by holding his head inwards, and in this way the dizziness is greatest.

- 6 And those who run turning to the left incline inwards more and make a more acute angle with the circle; for their right-hand parts are more weighty and force them more towards the inside (of the circle) through the weakness of their left-hand parts. And if they run in company with many (they become dizzy) to a greater degree and more quickly than (if they do so) alone. For in addition to the rotation in a circle their sight too itself, applying itself to those who are

someone turns around close to this, that person will become dizzy most quickly and more than the rest. The person who is closest is the one who turns his head in a smaller circle. And the more so the faster (he does it). And for this reason those who run also become more dizzy than those who walk, and those who do so swiftly than those who do so slowly. For they run leaning towards the centre. 44-60 *Phot.* 278 526b21-34 (*CB* 1.8 p.161.7-31): And those who run turning to the left (become more dizzy) than those to the right, because they make a more acute angle with the circle; for their right-hand parts are more weighty and force them more towards the inside (of the circle) through the weakness of their left-hand parts. And if they run in company with many (they become dizzy) more than (if they do so) alone, because in addition to the rotation in a circle their sight too, applying itself to those who are running and not being continuous, produces a certain movement and disturbance in the brain; and for this reason they become more dizzy because the brain undergoes a

θέοντες <τῶν ἐπὶ δεξιὰ μᾶλλον ἰλιγγιῶσι> ὅτι μᾶλλον *Grang. ex Phot.* ἔσω *Schneider*: ἴσως *A Tiph. Ald.* νεύουσι *B² in marg., Ald.*: νέουσι *A*: vacillant *Tiph.* 46 προσαποβιάζεται *A Ald.*: προσβιάζεται *Phot. Furl.* ἐντὸς *Phot. Schneider*: ἐν τοῖς *A Ald.*: om. *Tiph.*: αὐτοῖς *B in marg.*: αὐτοὺς *Furl.* 47 μὴ *A¹ Ald.*: punctis notavit *A²*: lineam verbo subscriptam exhibet *B*: om. *Tiph. Phot. Furl.* 48 περιφορᾷ *Phot. Grang.*: περιφερείᾳ *A Ald.* 49 αὐτῇ *Schneider ex Latina Furlani*

ἡ ὄψις αὐτὴ προσβάλλουσα τοῖς θεοῦσι καὶ συνεχῆς οὖσα τῷ
ἐγκεφάλῳ ποιεῖ τινὰ κίνησιν ἑτέραν καὶ ταραχὴν· ἀπὸ γὰρ 50
τῶν ἔξω διαδίδοται καὶ πρὸς τὰ ἐντός· ὥστ' ἐπεὶ καὶ ἑκάτερον
ποιεῖ τὸν ἱλιγγον, οἷον ἢ τε κύκλῳ κίνησις τῆς κεφαλῆς καὶ ἡ
ὄψις συνεχῶς βλέπουσα τὸ κύκλῳ κινούμενον, ἐξ ἀμφοτέρων
εὐλογον θάττον καὶ μᾶλλον γίνεσθαι τὸ πάθος.

7 ὅτι δὲ διὰ τὴν τῆς ὄψεως κίνησιν ἱλιγγιᾶν συμβαίνει 55
φανερὸν ἐκ πολλῶν. οἱ τε γὰρ πλείοντες θάττον καὶ μᾶλλον
ἱλιγγιῶσιν ὅταν ἐμβλέπωσι τοῖς κύμασι καὶ τῇ τῶν ὅλων
ἄστρον κινήσει, διὸ καὶ ἐγκαλύπτονται τοῦτ' εὐλαβούμενοι·
καὶ οἱ τὰς αἰώρας καὶ τοὺς τροχοὺς θεωροῦντες ἢ καὶ συμ-
περιφέροντες τὴν ὄψιν ταχὺ σκοτοῦνται· συμβαίνει γὰρ κι- 60
νουμένην κύκλῳ τὴν ὄψιν κινεῖν τὰ ἐντός ἀνωμάλως καὶ
ταράττειν.

8 ἱλιγγιῶσι δὲ καὶ οἱ τὰ ὑψηλὰ καὶ τὰ μεγάλα καὶ ἀπότομα 65
ἀποβλέποντες διὰ τὸ συμβαίνειν μακρὰν ἀποτεينوμένην
σειέσθαι καὶ κραδαίνεσθαι τὴν ὄψιν· σειομένη δ' οὕτως καὶ
κινουμένη ταράττει καὶ κινεῖ τὰ ἐντός. ἀναβλέπουσι δ' οὐ
συμβαίνει τοῦτο διὰ τὸ μὴ [ὥς] ἀποτείνειν μακρὰν ἀλλὰ

διὰ τὸ διπλὴν τὸν ἐγκέφαλον ὑφίστασθαι κίνησιν, τὴν τε ἀπὸ τῆς
περιδιήσεως, καὶ ἣν ἡ ὄψις παθοῦσα τῷ ἐγκεφάλῳ παρέπεμψεν. ὅτι δὲ (*M:*
om. A) διὰ τὴν τῆς ὄψεως κίνησιν ἱλιγγιῶσι πολλάκις, φανερὸν ἐκ πολλῶν.
οἱ τε γὰρ πλείοντες θάττον καὶ μᾶλλον ἱλιγγιῶσιν, ἐπειδὴν τοῖς κύμασιν
ἐμβλέπωσι, καὶ οἱ τὰς αἰώρας καὶ οἱ (*A: om. M*) τοὺς τροχοὺς θεωροῦντες
ταχὺ σκοτοῦνται. 63-68 *Phot.* 278 526b34-40 (*CB t.8 p.162.1-17*):
ἱλιγγιῶσι δὲ καὶ οἱ πρὸς τὰ ὑψηλὰ καὶ μεγάλα καὶ ἀπότομα ἀποβλέποντες,
διὰ τὸ συμβαίνειν μακρὰν τεινομένην σειέσθαι καὶ κραδαίνεσθαι τὴν ὄψιν·
σειομένη δὲ καὶ κραδαινομένη ταράττει καὶ κινεῖ τὰ ἐντός. τοῖς δ' ἄνω
βλέπουσιν οὐ συμβαίνει τὸ πάθος διὰ τὸ μὴ ἀποτείνειν μακρὰν ἀλλ'

49-51 *Cassius Iatrosophista, Problemata* 27.16-18 *Ideler* 60-62 *Galenus, De*
locis affectis 3 vol.8 p.202.6-7 *Kühn*; *Archigenes ap. Aëtium Amidenum, Iatrika*
6.7.11-17 63-66 cf. [*Aristotelem*], *Problemata* 3.20 874a12-21 86
[*Aristoteles*], *Problemata inedita* 2.39 (p.298.48-299.10 *Bussemaker*) =
[*Alexander Aphrodisiensis*], *Problemata* 4.39 *Usener*

Furlani versione: αὐτὴ *A Ald.* (et *Furl. in textu*): ipse *Tiph.* καὶ] μὴ *Phot.*,
approb. Schneider vol.4 p.774, sed cf. *Burn.* p.132 post οὖσα add. *Schneider*
(vol.4 p.774, vol.5 p.lviii) ἐν ex *Phot.* 57 ὅλων *suspectum censuit Schneider*
vol. 4 p.774: *om. Tiph.* 61-62 ἀνωμάλως καὶ ταράττειν *Schneider*: καὶ
ταράττειν ἄνω μᾶλλον *A Ald.*: moveat ac turbet. sed magis ... sursum *Tiph.*:

running and being continuous with the brain, produces a certain further movement and disturbance; for it is transmitted from the outside to the inside as well. So since each produces dizziness, that is the circular movement of the head and the sight continually looking at what is moving in a circle, it is reasonable that the experience should come about to a greater degree and more quickly from both (factors than from just one).

7 That dizziness comes about through movement of the sight is clear from many things. Those who sail become dizzy to a greater degree and more quickly when they look at the waves and the movement of all the stars, and for this reason they cover themselves up as a precaution against this; and those who look at swings and wheels or actually rotate their sight with them quickly become suffer blurred vision; for it comes about that as their sight moves in a circle it moves the inside parts unevenly and causes disturbance.

8 Those who look at high and tall and steep things become dizzy because it happens that their sight, stretched out to a great length, is shaken and vibrates, and being shaken and moved in this way it disturbs and moves the inside parts. This does not happen to those who look upwards because (their sight) does not stretch out a long

double movement, that from the rotation and that which the effect on the sight transmits to the brain. That dizziness often comes about through movement of the sight is clear from many things. Those who sail become dizzy more and more quickly if they look at the waves, and those who look at swings and wheels quickly become giddy. 63-68 *Phot.* 278 526b34-40 (*CB t.8 p.162.1-17*): Those who look at high and tall and steep things become dizzy because their sight, stretched out to a great length, is shaken and vibrates, and being shaken and moved in this way it disturbs and moves the inside parts. Those who look upwards do not have this experience because (their sight) does not stretch out a long way but is cut short by the light.

καὶ ταραττεῖν ἀνομάλως (*sic*) *B supra lineam*: καὶ ταραττεῖν ἀνωμάλως *Grang.* 63 ἱλιγγῶσι *Phot.* *Grang.* (*ita quoque in epitome, non emendatione, quam exhibet B in margine*): τῶν ἱλιγγῶν *A Ald.*: vertigine afficiuntur *Tiph.* (*per coniect.?*) 64 μακρὰν ἀποτεينوμένην *Grang.*: μακρὰ ἀποτεينوμένην *A Ald.*: μακρὰν τεινομένην *Phot.* 65 σειομένη *Phot.* *Schneider*: σειομένην *A Ald.*: σειομένην *R*: σειομενεν *B* δ' *A*: δὲ *Schneider* 66 κινουμένη *Phot.* *Schneider*: κινουμένην *A Ald.* ταραττεῖ καὶ κινεῖ *A Ald.* *Phot.*: ταραττεῖ καὶ κινεῖν *B corr. supra lineam* τὰ ἔντος *A Ald.*: *om. H*: cum sequentibus coniungit *Tiph.* ἀναβλέπουσι δ' οὐ *A Ald.*: τοῖς δ' ἄνω βλέπουσιν οὐ *Phot. Furl.* 67 ὥς *del. Wimm.*: exhib. *A Ald.*: *om. Tiph.* *Phot. Grang.*: ὥς *Schneider* ἀλλὰ *A*: ἀλλ' *BS et editores omnes* 69 δ' *A*: δὲ *H*: δι' *Ald.* τὸ αὐτὸ *Furl.*: τὶ αὐτὸ *Furl. adnot. p.264*: τοῦτο *A Ald.*: τούτω *R*: aliquid

ἀποτέμνεσθαι ἐν τῷ φωτί.

- 9 γίνεται δ' ἴλιγγος καὶ ὅταν εἰς τὸ αὐτὸ βλέπωσι συνεχῶς καὶ ἐπατενίζωσιν. ὃ καὶ ἐπαπορεῖται διὰ τί ποτ', εἰ κινου- 70
μένης κύκλῳ τῆς ὄψεως, καὶ ἡρεμούσης συμβαίνει τὸ πάθος·
ἄτοπον γὰρ τὸ ὑπὸ τῶν ἐναντίων. αἴτιον δὲ τοῦ μὲν ἐν τῇ
κυκλοφορίᾳ τὸ εἰρημένον, τοῦ δ' ἐν τῇ ἐπιστάσει καὶ τῷ
ἀτενισμῷ, διότι τὰ ἐν τῷ κινεῖσθαι σωζόμενα διίστησιν καὶ ἡ
στάσις· τῆς ὄψεως δὲ στάσης ἐνὸς μορίου, καὶ τᾶλλα τὰ 75
συνεχῇ ἐν τῷ ἐγκεφάλῳ ἴσταται· διιστάμενα δὲ καὶ
χωριζόμενα τὰ βαρέα καταβαρύνει καὶ ποιεῖ τὸν ἴλιγγον. τὰ
γὰρ πεφυκότα κινεῖσθαι τήνδε τὴν κίνησιν ἅμα τε καὶ συμ-
μένει διὰ ταύτην· εἰ δε μή, καθάπερ Ἡράκλειτός φησι, καὶ ὁ
κυκεὼν διίσταται κινούμενος. 80

- 10 εἴη δ' ἂν καὶ τῇ κυκλοφορίᾳ τὸ αὐτὸ τοῦτ' ἀποδιδόναι·

ὑποτέμνεσθαι (A: ἀπο- M) τῷ φωτί. 69-77 *Phot.* 526b40-527a9 (CB i.8 p.162.1-17): γίνονται ἴλιγγοι καὶ ὅταν βλέπωσι συνεχῶς καὶ ἐνατενίζωσιν. ὃ καὶ διαπορεῖται, τί δὴ ποτε κύκλῳ κινουμένης τῆς ὄψεως καὶ ἡρεμούσης τὸ αὐτὸ πάθος συμβαίνει. τὸ δ' αἴτιον τῆς μὲν κύκλῳ φορᾶς εἴρηται· διὰ τί δὲ ἐν τῇ ἐπιστάσει καὶ τῷ ἀτενισμῷ τὸ αὐτὸ συμβαίνει πάθος (A: πάθος συμβαίνει *vulg.*); διότι τὰ ἐν τῇ κινήσει σωζόμενα ἢ στάσις διίστησι. στάσης οὖν τῆς ὄψεως, καὶ τὰ ἄλλα συνεχῇ τὰ ἐν τῷ ἐγκεφάλῳ ἴσταται. ἴστάμενα δέ, καὶ συνδιίσταται (M: συνίσταται A) καὶ χωρίζεται τὰ βαρέα, καὶ καταβαρύνει, καὶ ποιεῖ τὸν ἴλιγγον. 81-93 *ibid.* 527a9-18 (CB p.162.17-27): καὶ ἡ κύκλῳ φορὰ δὲ διίστησι τὰ βαρέα καὶ τὰ κοῦφα. ποιεῖ

69-86 [Aristoteles], *Problemata inedita* 2.42 (p.299.31-46 Bussemaker) = [Alexander Aphrodisiensis], *Problemata* 4.42 Usener 79-80 Heraclitus, 22B125 Diels-Kranz. *Ita exhibet [Aristoteles]/[Alexander]*: ὁ δὲ κυκεὼν (Usener: κυκλεύων *codd.*), ὥσπερ καὶ Ἡράκλειτός φησιν, ἐὰν μή τις ταραττή (*cod. M*: κὰν μεταταράττη *cod. B*), ἴσταται (*codd.*: διίσταται Usener).

Tiph. συνεχῶς A Ald.: *om.* Schneider Wimm.: καὶ συνεχῶς Mouraviev p.34 n.3 70 ποτ' εἰ A: ποτε Ald. *Phot.* 71 *ante* πάθος *add.* αὐτὸ Grang. *ex Phot.* 72 ὑπὸ τῶν A Ald.: ὑπ' Schneider 74 *post* σωζόμενα *exhib.* τὰ βαρέα V *ante* διίστησι *add.* ἡ στάσις Grang. (*cf. Phot.*) διίστησιν A: διίστησι V^s Ald. καὶ *secl.* Schneider (vol.4 p.775, vol.5 p.lviii) *ducente Photio*: *post* καὶ *add.* χωρίζει Marcovich 75 δὲ στάσης Usener Wimm. (*cf. Phot.*: *ita quoque [Aristotelis] codd. plerique*): διάστασις A Ald. *Tiph.*: διαστάσει Lassalle I pp.75-6 76 ἴσταται Usener, Wimm. *ex Photio*: συνίστασθαι AB² Ald.: διίσταται Grang.: συνίσταται B¹ *et (dubitanter) Mouraviev* p.36: *uniuntur Tiph.* καὶ *om.* S 78 ἅμα τε Mouraviev p.34 n.3:

way but is cut short by the light.

- 9 Giddiness also comes about when people look continuously at the same thing and fix their gaze (on it); and this raises a problem why, if the experience comes about when the sight is moved in a circle, it does so also when it is at rest. For it is strange that (the effect) should be produced by opposite things. The reason for what happens in the case of the circular movement is what has been said, but for what happens in steadfast and fixed gazing it is that being at rest, too, separates what is preserved when there is movement. For when the sight in a single part (of the head) comes to rest the other parts in the brain continuous (with it) too come to rest; and when the heavy parts are separated and set apart they create heaviness and produce the dizziness. For the things which are naturally constituted to move with this movement at the same time also stay together on account of this; “if not, the posset too (would) separate when it is stirred,” as Heraclitus says.³⁷

- 10 This same explanation could be given in the case of circular

69-77 *Phot.* 278 526b40-527a9 (*CB* 1.8 p.162.1-17): Giddiness also comes about when people look continuously at the same thing and fix their gaze on it; and this raises a problem, why the same experience comes about when the sight is moved in a circle and when it is at rest. The reason (in the case) of the circular movement has been stated; but why does the same experience occur in steadfast and fixed gazing? Because things that are preserved in movement are separated by rest. So, when the sight comes to rest, the other parts in the brain continuous (with it) too come to rest; and coming to rest the heavy parts are separated and set apart they produce heaviness and create the dizziness. 81-93 *ibid.* 527a9-18 (*CB* p.162.17-27): Movement in a circle too separates the heavy and the light (parts). Stooping down also produces

³⁷ [Aristotle]/[Alexander]’s version is “The person who turns in a circle (emended by Usener to “the posset”), as Heraclitus also says, is at rest (emended by Usener to “separates”) if no-one disturbs (it/him) (cod. M; “even if you disturb it” cod. B)

ἄλλοτε *A Ald.*: ἄλλως τε *Grang.*: σῶζεται *Usener, Wimm.*: δῆλον ὅτι *tempt. Marcovich* 79 δὲ μὴ *A (ut vid.: cf. comm.) Ald.*: μὲν δὴ *Furl. p.265*: δὴ *coni. Bernays, approb. Usener* 80 κυκεῶν *A Ald.*: κυκλεύων *Forst.*² pp.140-1 *ex [Aristotele]* δίσταται *A Ald.*: συνίσταται *Furl.*: δὲ ἵσταται *Forst.*² *ex [Aristotele]*: ἵσταται *Mackenzie*: ἐπίσταται, i.e. ἐφίσταται *Ionico dialecto, temptavit van der Ben* μὴ *ante* κινούμενος *addendum coni. Bernays, acceperunt Usener Wimm.* κινούμενος *A Ald.*: κινούμενα *Grang.* (cf. *Furl. p.265*): κυκεύμενος *Mouraviev REG 98 (1985) p.132, cf. CQ 46 (1996) p.37*: κυκώμενος *Roussos² fr.31* 81 τὸ *A Ald.*: *om. Wimm.* 82 δίστησι *A*: δίσταται *Ald.*

δίιστησι γὰρ ἡ δίνη τά βαρέα καὶ κοῦφα δέον ἅμα εἶναι, τὰ
μὲν εἰς τὸ μέσον ἄγουσα τὰ δ' εἰς τὸ ἔσχατον. ποιεῖ δὲ καὶ τὸ
κύπτειν ἰλίγγους διὰ τοῦτο· χωρίζεται γὰρ τὰ βαρέα καὶ
ἐλαφρὰ, τὰ μὲν ἄνω τὰ δὲ κάτω· δεῖ δ' ἅμα εἶναι καθάπερ 85
ἐλέχθη.

- 11 ποιεῖ δὲ καὶ ἄλλη τις ἐναντίωσις ὡς δοκεῖ, οἶον ἡ τῆς
ἐνδείας καὶ τῆς πληρώσεως· ἡ μὲν γὰρ ἐνδεια σύντηξιν ἡ δὲ
πλησμονὴ περίττωσιν ἐποίησεν ὥστε πλήρεις γίνεσθαι τοὺς
πόρους· ἀμφοτέρα γὰρ ταῦτα καταβαρύνει καὶ δίιστησι τὰς 90
περιόδους, ὅπερ ἐστὶν ὁ ἴλιγγος· ἐπεὶ καὶ αἱ μέθαι καὶ αἱ
φαρμακεῖαι καὶ ὅσα ἄλλα τούτοις παραπλήσια διὰ τοῦτο
12 ποιεῖ τοὺς ἰλίγγους. ὅθεν καὶ τὸ σημείον τινες ἐπ' ἀμφοῖν
κοινὸν λαμβάνουσιν· ὅταν γὰρ μὴ δύνηται τις τοὺς
στρωτήρας ἢ τὰς δοκοὺς ἀριθμεῖν, τὸν μὲν οὐπω κεκαθάρθαι 95
τὸν δὲ μεθύειν <φασίν>. ἡ ὑγρότης γὰρ ἡ ἀλλοτρία ἐμπεπ-
τωκυῖα ποιεῖ τὴν ταραχήν· διὸ καὶ ἐφ' ὅσων ἄλλων συμβαίνει
πνεύματος ἢ ὑγρότητος γίνεσθαι πλήθος ἢ καὶ τῶν

δὲ καὶ τὸ κύπτειν ἰλίγγους· καὶ γὰρ ἐν τῷ κύπτειν χωρίζεται τὰ βαρέα καὶ
τὰ ἐλαφρὰ, τὰ μὲν ἄνω, τὰ δὲ κάτω· δεῖ δὲ ἅμα εἶναι, καθάπερ ἐλέχθη. ποιεῖ
δὲ τὸ πάθος καὶ πλησμονὴ καὶ ἐνδεια, ἡ μὲν ἐνδεια σύντηξιν, ἡ δὲ
πλησμονὴ περίττωσιν ποιοῦσα, ὥστε πλήρεις γενέσθαι τοὺς πόρους.
ἀνιοῦσα γὰρ παρ' αὐτὰ καταβαίνει (A: καὶ καταβαίνει M), καὶ δίιστησι
τὰς περιόδους· ὅπερ ἐστὶν ἴλιγγος· ὅτι καὶ αἱ μέθαι καὶ αἱ φαρμακεῖαι καὶ
τὰ παραπλήσια ποιοῦσιν ἰλίγγους· 96-97 Phot. 278 527a18-19 (CB i.8
p.162.27-8): ἡ γὰρ ὑγρότης ἡ ἀλλοτρία ἐμπίπτουσα ποιεῖ τὴν ταραχήν.

87-93 [Aristoteles], *Probl. ined.* 2.43* Bussemaker = [Alexander Aphrodisiensis], *Problemata* 4.43 Usener. Cf. Archigenem ap. Aëtium Amidenum, *Iatrica* 6.7.11-21 93-97 [Alexander Aphrodisiensis], *Problemata* 2.33; [Aristoteles], *Probl. ined.* 2.105* Bussemaker = [Alexander Aphrodisiensis], *Problemata* 4.107 Usener. Cf. [Aristotelem], *Probl.* 3.9 872a18-21 = 3.20 874a5-8; [Alexandrum Aphrodisiensem], *Problemata* 2.71 Ideler

βαρέα A: δὲ βαρέα Ald.: τε βαρέα Schneider δέον] δέοντα con. Schneider (vol.4 p.777) 83 ἄγουσα A Tiph.: ἄγουσι Ald. τὰ δ' BHSO Tiph. Ald.: τόδ' A: τόδ' vel τὸ δ' cett. (Burn. p.16) 84 τοῦτο] fort. ταῦτο Mouraviev p.37 85 <τὰ> ἐλαφρὰ Schneider ex Phot. δ' A: δὲ B Phot. 85-88 in mg. sinistr. ad δεῖ δὲ ἅμα — πληρώσεως scribitur in A: τοῦτο 80 post δοκεῖ spatium relictum circa 8 litt. A: lac. exhib. Ald.: <τὸν ἴλιγγον> Grang.: <τὸ πάθος>

movement too; for the whirling separates the heavy and light (parts) when they ought to be together, bringing the former to the centre and the latter to the circumference. Stooping down also produces dizziness for this reason; for the heavy and light parts are set apart, some upwards and the others downwards. But they ought to be together, as was said.

- 11 Another opposition too produces (dizziness), as it seems, namely that of lack (of nourishment) and satiety. For lack produced colliquescence and surfeit (produced) residue, so that the passages are filled; and both these weigh upon and separate the rotations (in the head), and this is what dizziness is. For alcoholic drinks too, and administerings of drugs and as many other things as are like these produce
12 dizziness for this reason. Consequently also some people take the same indication of both: for when someone cannot count the rafters or the roof-beams, <they say> that one is not yet (properly) purged, another is drunk. It is the intrusion of alien fluid that produces the disturbance; and for this reason this experience comes about from all other things from which abundance of breath or fluid, or separation of

dizziness; for in stooping too the heavy and light parts are set apart, some upwards and the others downwards. But they should be together, as was said. The experience is also produced both by satiety and by lack (of nourishment), lack producing colliquescence and surfeit (producing) residue, so that the passages are filled. Going up by these it descends³⁸ and separates the rotations (in the brain): and this is what dizziness is. For alcoholic drinks and administerings of drugs and things like these produce dizziness. 96-97 *Phot.* 278 527a18-19 (*CB* t.8 p.162.27-8): It is the intrusion of alien fluid that produces the disturbance.

³⁸ The text of Photius here corresponds to that in cod. A of Theophrastus; the text and translation of Theophrastus given above reflect Wimmer's emendations.

Schneider ex Phot. 88 post ἔνδεια *add.* εἰς τὰ κένα *Usener ex [Alexandro], Probl. 4.43* 90 ἀμφοτέρα *Wimm.*: ἀνιοῦσα *A Ald.*: ob gravitatem *Tiph.* ταῦτα *A Ald.*: παρ' αὐτὰ (= παραχρῆμα: *vol.4 p.777*) *Schneider ex Photio:* αὐτῇ *Grang.*: αὕτῃ *Furl.* καταβαρύνει *Wimm.*: καταβαίνει *A Tiph Ald.* δίστησι *A:* ἐφίστησι *Usener ex [Alexandro], Probl. 4.43:* accepit *Wimm.* 90-91 ταῖς περιόδοις *Grang.*: om. *Tiph.* 92 καί] τῆς *Furl.*, *typorum errore:* καὶ *supra lineam add. S* διὰ τοῦτο om. *Tiph.* 94 τις om. *Ald.* 95 τὸν A² *Grang.*: τῶν *codd. alii et Ald.* (cf. *Burn. p.68*) κεκαθάρθαι *Grang. ex [Alexandri] probl. 2.33:* και*τασθαι *A, spatio circa 10-14 litt. relicto, Ald.*: superatum *Tiph.*: (ἀ)πό τον οἶνον ἢ in *mg. sinistr. add. A* 96 φασὶν *add. Grang:* om. *A* ἢ (*pr.*) *A Phot.*: ἢ *V* ὑγρότης *Phot. Grang.*: ἰλαρότης *A Tiph. Ald.* γὰρ post ἄλλοτρία *A Ald.*: *transpos. Furl. (cf. Phot.)* 98 πλῆθος *Schneider:* τὸ πλῆθος *Grang.*: πα* *ARBzS*

ὑπαρχόντων διάστασιν ἀπὸ πάντων συμβαίνει τοῦτο τὸ πάθος.

100

- 13 ἀνιστάμενοι δὲ μᾶλλον ἢ καθίζοντες ἱλιγγιῶσιν ὅτι ἡρεμούντων συνίσταται τὸ ὑγρὸν ἐν τῇ κεφαλῇ πλέον, ὅταν δὲ κινῶνται φανερόν γίνεται καὶ εἰς ἓν μόριον ἀθρόον ἀποκλῖνον ποιεῖ τὸν ἱλιγγον.

101-104 *Phot.* 278 527a20-3 (*CB* 1.8 p.162.29-163-2): ὅτι ἀνιστάμενοι μᾶλλον ἢ καθίζοντες ἱλιγγιῶσι, διότι ἡρεμούντων μὲν συνίσταται τὸ ὑγρὸν ἐν τῇ κεφαλῇ πλέον, ὅταν δὲ κινῶνται, διίσταται καὶ εἰς ἓν μόριον ἐμπίπτον ποιεῖ τὸν ἱλιγγον.

101 *Anonymus Parisinus* 17.2.2 p.110.15-16 *Garofalo* 101-104 [*Aristoteles*], *Problemata* 6.4 885b35-886a2; [*Aristoteles*], *Problemata inedita* 2.49 (p.301.1-9 *Bussemaker*) = [*Alexander Aphrodisiensis*], *Problemata* 4.49 *Usener*

Ald cett. (cf. *Burn.* pp.18, 49): *om.* *Tiph.*: επιτομα in *mg. sinistr.* A: παι* VN: πάθη V^o: *lacunam indic.* H 99 διάστασιν H *Grang.*: διάστασις A *Ald.* 102 *post* ἡρεμούντων *add.* μὲν *Schneider ex Photio* πλέον *om.* *Tiph.* 103 φανερόν A *Usener Forst.*² 141: σφαλερόν *Grang.* μορίον *Phot. Grang.* ex [*Aristotele*]: μόνον A 103-104 ἀποκλῖνον *Usener Wimm.*: ἄγον A *Ald.*: *corruptum censuit Schneider vol.4 p.778*: ἐμπίπτον *Phot.* εἰς — ἀποκλῖνον] *dimota tantum Tiph.*

those that are already present, come about.

- 13 People become dizzy more when they stand up than when they are seated, because when they are at rest the fluid in the head gathers together in larger quantity, and, when they move, it becomes apparent and, inclining all together to a single part, produces the dizziness.

101-104 *Phot. 278 527a20-3 (CB t.8 p.162.29-163-2)*: People become dizzy more when they stand up than when they are sitting down, because when they are at rest the fluid in the head gathers together in larger quantity, and, when they move, it is separated and, inclining all together to a single part, produces the dizziness.

COMMENTARY

1 Περὶ ἰλίγγων] The Greek has the plural, as in the first line of the text proper. In principle the plural might be translated either as “(cases of) dizziness”, indicating a survey of a range of phenomena, or “(types of) dizziness”. The latter however could imply a structured classification, which does not in fact seem to be present in this text (see above, p. 173 n. 10); and even if it were, to introduce a reference to “types” in the very first words of the text, when they have not yet been distinguished, would seem premature. “(Cases of) dizziness” therefore seems to be the appropriate translation in the text; but since “*On (Cases of) Dizziness*” is somewhat cumbersome for practical use as a title in English, I have let “*On Dizziness*” stand even though it is strictly speaking inaccurate. See also above, p. 174 n. 11, and White 2002.

1.2-4 ὅταν ἡ πνεῦμα ἀλλότριον περὶ τὴν κεφαλὴν ἔλθῃ ἡ ὑγρότης περιττωματικὴ [ἡ] ἀπὸ τροφῆς ἐνίας, οἶον ἡ τοῦ οἴνου ἡ καὶ ἄλλου τινὸς χυλοῦ] The very first line shows that Wimmer’s use of A was less than perfect; his emendation ἡ was unnecessary, reflecting the fact that ἔλθῃ had been omitted by the Aldine and by Schneider. But it is clearly visible in A, and Photius has it too. My rendering “an *alien* breath moves around the head” is intended to be neutral as to whether what is envisaged is πνεῦμα from another part of the body or from outside. (Bill Fortenbaugh, comparing *On Sweat* 33.212-213, mentions to me the case of an athlete taking in a lot of breath before a competition and so becoming faint. This is actually due to the resulting loss of blood pressure in the brain.)³⁹ The alternative translation “inappropriate” creates difficulties in the reference we would then have in line 4 to an “inappropriate excess”. For what would an “appropriate excess” be?

³⁹ Brandt 1999, p. 23.

The problem in this section is to establish how many alternative sources of dizziness Theophrastus is indicating. And this is bound up with the question of the correct reading in line 3. If we retain ἢ the possibilities are (i) alien breath (πνεῦμα), (ii) moisture which may be either (iia) of the nature of residue or (iib) from nourishment such as⁴⁰ wine or some other juice,⁴¹ or (iii) circular movement of the head. Since (iia) and (iib) can be seen as subdivisions of a single possibility, the fact that we have here four possibilities of which the last is introduced by “thirdly” need not be seen as an objection (and 12.97-99 seems to refer back to (i)-(iii) here; see the Commentary on this passage, below); the coupling by “or” of the adjective περιττωματική and the prepositional phrase ἀπὸ τροφῆς ... χυλοῦ may be more difficult. The strongest argument for omitting ἢ, however, is that it excludes the possibility of taking the reference to wine or other juices with *both* the preceding alternatives, πνεῦμα and moisture.⁴² Here at the start of the essay the most non-committal reading seems likely to be correct; there is a striking parallel with the similar question, breath or moisture, which opens *On Sweats*.⁴³ On the other hand, the text of A in line 3 suggests that there may be some more deep-seated corruption. (Tiph. has *qu(a)e vel*, with no verb to follow the relative *quae*, perhaps rendering ἡ ἢ?) Photius at first seems to confirm the ἢ before ἀπὸ τροφῆς in Theophrastus; but in fact his ἢ is parallel in function to that before τοῦ οἴνου in Theophrastus. For wine as τροφή cf. [Aristotle], *Problems* 3.5 871a30-1 = 3.26 874b25; more generally, nourishment includes both dry and moist (Aristotle, *On Sensation* 5 444a16; *Generation of Animals* 4.11 767a30 ff.).

The words “moves around the head” should probably be taken as a vague indication of movement to that region (Photius paraphrases περὶ by “into the head”, εἰς, if indeed he did not find εἰς in his MS; Tiph. understood περὶ as *ad*, “to the region of”) rather than as referring to the rotatory movement the text goes on to discuss. For that would imply that breath as well as fluid plays a part in that rotatory movement itself; but

⁴⁰ Interpreting the second ἢ in 3 as “either”; Schneider 1818-21, vol.4 p. 770 takes it as “or” and argues that a reference to some kind of food that produces vapour has dropped out after οἶον.

⁴¹ That Theophrastus has drugs in mind here is suggested by §11 below.

⁴² I am grateful to Han Baltussen and Istvan Bodnár for pointing this out.

⁴³ Ἰλιγγος is defined as blockage of moisture and πνεῦμα in the head by Anonymus Parisinus 17.1, p. 110.6-7 Garofalo 1997. He adds the point—not in Theophrastus—that these fill the eyes and push them forward, and that this causes the visual disturbance.

that is not indicated either in 1.6ff. or in the rest of the treatise. See below, on 12.97-100.

1.5-6 ὁ γὰρ τόπος ὁ περὶ τὸν ἐγκέφαλον φύσει μὲν ὑγρὸς ἐστίν] For the sense of “the region around the brain” see above, p. 175 n. 16. Whatever view we take of the number of sources of dizziness indicated in lines 2-4, it seems probable that this subsumes them all; the problem is circular movement in the head, whether this is caused directly by physical movement, as in option (iii), or by the effects of πνεῦμα or moisture.⁴⁴

Both Archigenes and Galen speak explicitly of a πνεῦμα rising up to the head from the rest of the body, and suggest that some cases of excessive susceptibility to dizziness can be cured by severing arteries (ἀρτηριά) behind the ears through which the πνεῦμα passes. Scar tissue then blocks the arteries. Archigenes says that one should have recourse to this remedy after trying remedies by means of purges. Severing the arteries behind the ears does not always work, though, Galen notes, as the πνεῦμα can get through by other deeper and less accessible ones.⁴⁵

1.6 ὅταν δ' ἔλθῃ τι πλεόν ἁλλότριον] The change of πλεόν (“excess”) to πνεῦμα (“breath”) in the margin of B is an easy one in the light of line 1 above; comparison with other marginalia in B suggests it was indeed intended as an emendation rather than as a gloss. It was not however followed by S or Ald. Subsequently indeed it was adopted by all editors from Grangerius to Wimmer inclusive. Nevertheless I have not thought it appropriate to go against the combined testimony of all the MSS and of Photius (though cf. line 90 below for a case where a corruption does antedate both A and Photius). The reference to “abundance” (πλῆθος) in §12 also supports “excess” (πλεόν) here, as Bill Fortenbaugh points out to me. If in line 7 we insert καὶ not before ὠθεῖ with Schneider but before πρὸς with Ald., the sense will be that the excess drives fluid to the vessels; but the consequent close coupling of “to the vessels” and “in a circle” seems awkward from the point of view of understanding the whole process. At 12.88-91 the effect on the vessels

⁴⁴ I am grateful to André Laks for the points in this paragraph.

⁴⁵ Anonymus Parisinus 17.3.1-5, pp. 110.20-112.14 Garofalo 1997, recommends phlebotomy and a number of other remedies, which have in common the aim of reducing moisture.

precedes, and indeed causes, the disruption of the circular movement. (Tiph. supplies “and” rather before διαδύμενον: “is forced in (taking βιάζεται as passive) and, percolating...”.)

1.10 ἔξωθεν ἢ ἔσωθεν εἶναι τὸ κινουῖν] As Bill Fortenbaugh points out, to refer to deliberate movement of one’s own head as movement from an external source may seem odd; but, as he also notes, exercise is described as external motion in *On Sweat* §15.

1.10-11 οὕσης <δὲ> οἷον δίνης τινὸς τῆς φορᾶς] At first sight one might think that *vehemens* in Tiph.’s *cum scilicet vehemens qu(a)edam humoris circumvolutio est* represents δεινῆς and *circumvolutio* φορᾶς; but since A, on which Tiph. based his translation, has δινῆς (*sic*), one would have to suppose that Tiph. in translating “corrected” δινῆς to δεινῆς and also paraphrased φορᾶς as *circumvolutio*. The alternative is to suppose that he understood δίνης and that *vehemens ... circumvolutio* paraphrases δίνης and φορᾶς together (he uses *circumvolutio* to translate δίνη at 10.82); but if he understood δίνης as a noun his translation fails to take proper account of τῆς.

1.11 τοῦ ὑγροῦ μὴ συνεχοῦς ὄντος] Stephen White points out to me that the ὁμοίως of the Theophrastus MSS is absent from Photius and that the construction with μὴ leads one to expect a participle; hence his emendation to ὄντος. He further suggests omitting δὲ in 8 and καὶ in 9, and construing the whole thus: “for it makes no difference whether the origin of movement is external or internal, since the movement is like some whirl of the fluid if (conditional force of the participle explaining the μὴ) it is not continuous; but part being behind in the movement and part in advance, what settles strikes against [what is moving] and brings it to a halt.” However, it seems difficult to separate “since the movement ... not continuous” and “but part being ... part in advance”, which form the two halves of a single antithesis.

1.13-14 διὰ τὸ μὴ ἰσορροπεῖν ὁμοίως αὐτῇ] A has αὐτή, “because this is not in equilibrium in the same way”; the rough breathing appears to have been added by a corrector, before another mark which might itself be a rough breathing (so that the corrector would simply have been clarifying an ambiguity?); the accent appears to be in the first

hand, and itself implies a rough breathing (there being no form αὔτη or αὔτη). But the feminine gender is problematic in the context, for “what is brought to a halt” is grammatically neuter. Tiph. has (*a*)*eque ... atque prius*, “in the same way as before”, perhaps simply interpreting the reading in A, or else implying the reflexive αὐτῇ (“in the same way as itself”); the reflexive gives a good sense, but again the feminine is problematic. (Although Tiph. is responsible for some emendations in A—see above, p. 179 n. 29—it seems unlikely that he is responsible for correcting a previous rough breathing to a smooth breathing in A, for the rough breathing is present in both B and V, which derive from D which antedates Tiph.) Presumably because of the problem of the gender, B³ emended to αὐτῇ, “in the same way as it” we must then understand Theophrastus as referring to the movement (κίνησις or φορά), or perhaps to the whirlpool (δίνη: I am grateful to Stephen White for this suggestion) when in fact the reference is more strictly to what is being moved. Schneider’s emendation to the neuter αὐτῶ or αὐτῶ removes the problem of the gender, in the first case giving a similar sense to Tiph.’s, in the latter suggesting “is not in equilibrium in the same way as (the fluid that is still moving)”.

1.14 ἥ ἂν ῥέῃ] Wimmer’s emendation (“in whatever direction it inclines”) seems unnecessary. I am grateful to Stephen White for discussion of the interpretation of this passage.

2.17-21 παραπλήσιον γὰρ τὸ συμβαῖνον ὥσπερ ἐν τοῖς ὠοῖς τοῖς ὠμοῖς· οὐδὲ γὰρ ταῦτα δύναται δινεῖσθαι διὰ τὴν ὑγρότητα, τὰ δ’ ἐφθὰ δύναται διὰ τὸ μὴ ἔχειν τὸ σφάλλον ὑφιστάμενον ἐνὸς ὄντος καὶ συνεχοῦς <τοῦ ἐντός>] If, with Furlanus (followed by Heinsius, Schneider and Wimmer), we include the supplement from Photius in line 20, the resultant sense would be “(raw eggs) cannot be spun, because of the fluidity, but boiled (eggs can), because some things are overturned by fluidity that is not uniform and not in equilibrium, while others are not, because they do not have anything that settles down and overturns them”. But this is long-winded and clumsy; it is also illogical, for it may seem to suggest that there is a division among things with non-uniform fluid, some being overturned and some not. If it is not taken in this way, it becomes a statement of the obvious—the reason that some things are overturned by such fluidity and

others not is that some have it and some do not. If we omit the supplement, on the other hand, the sense is clear: raw eggs cannot be rotated, because of the fluidity, but boiled ones can because they do not have anything that settles down and overturns them. Grangerius adds σφάλλεσθαι after ὑγρότητα in 19, from comparison with Photius (Grangerius p. 35 verso), but does not include it in his translation (p. 34 recto): the sense would be “because what is fluid is overturned”, but the addition is unnecessary. Stephen White suggests that “(the boiled egg) being single and continuous” could be understood without the addition of τοῦ ἐντός in 21; but the expression seems abrupt.

The example of the raw egg which cannot be spun is used in [Aristotle], *Problems* 6.4, as Vogt 2002 notes, to explain the phenomenon discussed by Theophrastus in §13 below.

3.22-24 αἱ μὲν οὖν αἰτίαι σχεδὸν αὗται καὶ τοιαῦται τοῦ πάθους. ἀφ’ ὧν δὲ συμβαίνει γίνεσθαι τὰ καθ’ ἕκαστα περὶ ὧν ἀποροῦσι πρὸς ταῦτα ἀνάγειν πειρατέον] The translation takes ταῦτα simply as the anticipated antecedent of ὧν. The alternative would be to take ταῦτα as referring back to the “reasons”, αἰτίαι, in 18, “Well, these and similar ones are more or less the reasons for the experience. We must try and refer to these (general principles) the (reasons) from which the particular occurrences come about concerning which people are perplexed”. This implies more of a connection between what precedes and what follows, and the first interpretation makes Theophrastus say little more than that we should try to explain each thing by its cause; against the second interpretation, however, is the gender of ταῦτα (neuter) and αἰτίαι (feminine). One might also take τὸ πάθος (understood) as subject of συμβαίνει and τὰ καθ’ ἕκαστα as object of ἀνάγειν: “We must try and refer the particular occurrences, concerning which people are perplexed, to the (reasons) for which (the experience) comes about”. (I am grateful to Stephen White for this suggestion and for discussion of the passage.)

The vagueness of the first sentence is in any case noteworthy; one might suppose that §§1-2 had completed the theoretical explanation, and that all that remained was to apply it, but in fact the relation between the account given in §§1-2—however close it may or may not here be implied to be—and the explanations given later in the essay is not entirely unproblematic; see above, Introduction p.174.

§3 lists problems for which solutions are offered in §§4-6. Dizziness is produced by turning round in the same place, and therefore, it is supposed (§4 init.), the smaller the circle in which one moves—and specifically, as we shall see, the smaller the circle in which one's *head* moves—the greater the resulting dizziness. Dizziness in fact occurs not when one is running in small circles, but when one stops.⁴⁶ Theophrastus does not make this explicit here, but see below on §13. Antyllus, quoted by Oribasius, *Coll. med.* 6.22.10, says that running in a circle is good for the chest and legs but not for problems of the head.⁴⁷

Vogt 2002 identifies five factors affecting dizziness that are discussed in §§3-6, (1) the size of the circle, (2) the angle of inclination, (3) watching other accompanying runners, (4) the direction of circular motion and (5) the height of the runner. She identifies (1), (2) and (5) as arising from theoretical considerations to do with the geometry of the cone, and regards only (3) and (4) as empirically based. One may however doubt whether the claim that those who run anti-clockwise become more dizzy ((4), §6) has much of an empirical basis either; it too seems to arise from theoretical considerations, but ones connected with the superiority of the right-hand side in Aristotelian biology (below, on 6.36-38) rather than with geometry. (3) has more claim to reflect actual experience. There is also a question as to what part the *speed* of running plays in Theophrastus' account. See further below, on 4.34, 5.38, 5.40.

Furlanus prints τοῖς in 23 with the MSS but translates as if he had τὰ with Photius and Grangerius: cf. Schneider 1818-1821, vol.4 p. 773.

3.25-26 καὶ ἔτι μᾶλλον [καὶ] ὅσῳ ἂν ἐλάττω κύκλον, καὶν θᾶττον θέωσι σφοδρότερον] The text has been emended from Photius. It would be desirable to maintain the MS καὶ in 25 and καὶ for the first καὶν in 26; but it is then difficult to extract a satisfactory sense.

3.26-27 καὶν μετὰ πολλῶν ἢ μόνοι] Schneider's text has καὶ μόνοι, but this is a misprint: vol.2 p. 609 and vol.5 p. lviii show that he intended ἢ μόνοι with Phot. and Grang.

⁴⁶ I am grateful to John Haight for pointing this out.

⁴⁷ Noted by Furlanus 1605, p. 263.

3.27 καὶ ἐπ' ἀρίστερα θέοντες μᾶλλον] Grangerius adds “than to the right” from Photius; he was not followed in this by Furlanus or Heinsius, but Schneider and Wimmer accept the words into the text. Furlanus’ caution may however be right; the sense is clear without the added words, and it is questionable whether we should go against the MSS of Theophrastus.

3.28-29 ἐν τοῖς πρότερον εἰρημένοις] Grangerius’ “in what has been said subsequently” has not been accepted by any subsequent editor, and Photius’ προείρηται supports the transmitted text of Theophrastus. The connection of thought between what has preceded and the problems about to be discussed is indeed somewhat general; it is simply that the explanations that follow apply the principle of dizziness caused by rotation that has been outlined in §§1-2. But Theophrastus has after all just said “we must try and refer to these (general principles) the reasons from which the particular occurrences come about”.

In his first edition Wimmer has αἰτιᾶται, with A and all previous MSS and editions, in the printed text, but αἰ αἰτίαι in his note on p.xxv; in the second edition αἰ αἰτίαι is incorporated into the text. Photius’ ἡ αἰτία clearly supports this reading.

4.30-32 εἶπερ γὰρ ὁ ἱλιγγος γίνεται εἴ <τις> ἐν τῷ αὐτῷ στρέφοιτο, τάχιστ' ἂν καὶ μάλιστα τῶν λοιπῶν ἱλιγγίῳ ὁ ἐγγυτάτω ἢ ὁ ἐν ἐλάττονι κύκλῳ στρέφων] Photius has “If dizziness comes about if someone turns his head around in the same place, it is clear that, if someone turns around close to this, that person will become dizzy most quickly and more than the rest. The person who is closest is the one who turns his head in a smaller circle.” The vulgate text of Theophrastus, deriving from the correction ἱλιγγίῳ ὁ in the margin of B (and cf. Photius), simply has “if dizziness comes about if someone turns around in the same place, the one who turns closest, or who turns in a smaller circle, will be dizzy most swiftly and more than the rest.” But it is clear from the readings of A and H that there was originally *something* more than this in the text. Grangerius, followed by Schneider and by Burnikel 1974, p. 137 (but not by Furlanus or Wimmer) restores from Photius in 30 material which the MSS of Theophrastus omit. Reading with Grangerius and Schneider ἱλιγγίῳ, ἐγγυτάτω δὲ ὁ in 31, we will then have “If dizziness comes about if

someone turns his head in the same place, it is clear that if someone turns near this person he will be dizzy most swiftly and more than the rest, and the one who turns in a smaller circle is closest". Burnikel follows the correction in B and Photius (and Furlanus and Heinsius and Wimmer) in reading ἰλιγγιώη ὁ, but unlike them deletes the following ἐγγυτάτω ἢ ὁ, giving "If dizziness comes about if someone turns his head in the same place, it is clear that if someone turns near this person the one who turns in a smaller circle will be dizzy most swiftly and more than the rest;" he was anticipated in this reading by Tiph. (*ante omnes vertiginem patiuntur qui in minore circulo vertuntur*). But ἐγγυτάτω occurs not only in Photius but also in the MSS of Theophrastus. It is unsafe to assume that material present in Photius' paraphrases but not in our MSS of Theophrastus always reflects genuine Theophrastean material lost from our MSS, and after some hesitation I have chosen to follow Wimmer in retaining ἐγγυτάτω in 31 but rejecting the supplement from Photius in 30. Rejecting the supplement from Photius in 30 requires one to follow Wimmer in rejecting A's ἐάν, appropriate with στρέφη in the supplement but not with στρέφοιτο; but the need to insert τις shows that correction is needed at this point in any case.⁴⁸

4.33 διόπερ <καὶ> οἱ θέοντες] S has διὸ καὶ in place of διόπερ of all the other MSS and editions (including B, S's source) before Schneider, who took διόπερ <καὶ> from Photius. S thus partly anticipates Schneider by over three centuries; I can only explain this either by the scribe of S knowing Photius (but then why not put διόπερ καὶ, unless he was a textual critic sophisticated enough to weigh the probability of letters having been misread rather than omitted?) or in terms of his simply feeling that the word was needed.

4.34 θεουσι γὰρ [οἱ] <ἐγκεκλικότες> πρὸς τὸ κέντρον] People who run round in circles lean inwards (to counteract what is popularly called centrifugal force, though Theophrastus does not make this point). Therefore those who run in smaller circles have their heads closer to rotating on the spot, and become more dizzy. (In figure 1, E describes a smaller circle than does B). This seems over-ingenuous as an explanation for the effect of running in small circles; the leaning might

⁴⁸ I am grateful to István Bodnár for discussion of the material in this section.

explain why dizziness is felt in the head rather than in the feet, but we have an explanation for that anyway, and even if people ran bolt upright the size of the circle described by their heads would still be smaller if the size of that traversed by their feet was. The point of the leaning inwards and the reference to the cone is rather to stress the fact that rotation on the spot is the limiting case of going round in smaller and smaller circles.

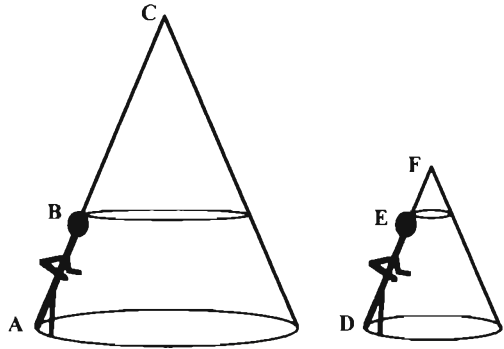


Fig. 1

The question arises just what part the speed of running plays in Theophrastus' account. One possibility, favoured by Vogt 2002, is that the contribution of the speed is *entirely* through its effect on the angle of leaning and hence on the size of circle described by the head. On this view it is the smallness of the circle, and consequent approximation of the movement to rotation on the spot or spinning, that is the only relevant factor; the speed of movement in itself is irrelevant (and indeed, the smaller the circle described by the head the less the distance it traverses will be). It follows that "those who do so swiftly more than those who do so slowly" in 33-34 must imply, reasonably enough, that the angle of inwards leaning is greater the faster one is running. See below, on 5.38.

If we include both οἱ and ἐγκεκλικότες in the text, the sense, as Bill Fortenbaugh points out to me, will be "for those who lean towards the centre [are those who] run", and by implication those who run particularly fast. But we then have a hybrid of the MSS version and Photius': that is, we are supposing that οἱ was omitted by Photius and ἐγκεκλικότες dropped out of the MSS, and this may seem too much of a coincidence. The original text might have had οἱ followed by something else now lost—unless we suppose that οἱ is not the article but the corrupted remnant of whatever was lost.

5.38 ὅσῳ ἂν ἐλάττω κύκλον μᾶλλον, ὁξύτερος γὰρ ὁ κῶνος] If this means that the angle *at the vertex* of the cone is more acute, the implication is that, the smaller the circle, the less the person

running leans. That is false as far as reasonably large circles are concerned—an indoor running track is banked at the turns whereas an outdoor one, being larger and not having such tight turns, is not. On the other hand, the smaller the circle the less quickly one can run, and therefore the less one will in fact need to lean;⁴⁹ but as Sabine Vogt has pointed out to me it is not clear how far Theophrastus treats the three issues of size of circle, angle of inclination and height of runner as independent of each other and how far as interdependent; and this is bound up in turn with the question, discussed in Vogt 2002, how far the use made of the geometry of the cone in the present discussion is concerned with physical realities and how far it is purely geometrical in its motivation. (Vogt well compares such discussions as [Aristotle], *Mechanica* 1 848b3ff., on why a point further from the centre of a rotating circle traverses a greater distance in an equal time.)

If the thought is of running round almost on the spot there does come a point at which people lean over less as the circle in which they are running becomes smaller. After all, if it was small enough and you leaned far enough your head would be on the other side of the centre from your feet. But it is not clear that this is the sort of context Theophrastus has in mind; compare the references in §§3 and 6 to walking or running in a circle along with many other people. And in any case, the effect of a more upright stance is actually to make the circle traversed by the head *larger* in relation to

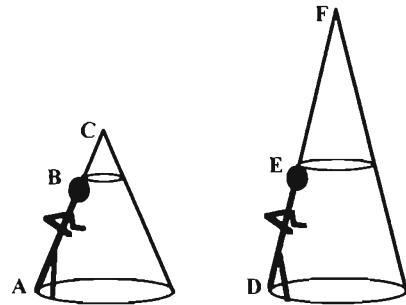


Fig. 2

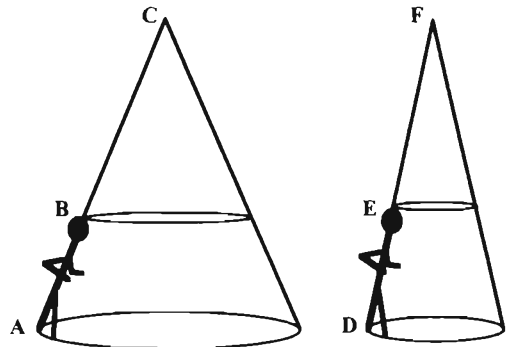
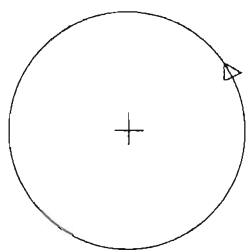


Fig. 3

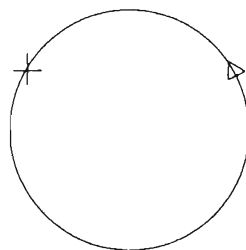
⁴⁹ I am grateful to Bill Fortenbaugh for these points.

that traversed by the feet than it would otherwise be. In figure 2 A and D traverse circles of equal sizes; but E, where the vertex of the cone is more acute, traverses a larger circle than does B. Perhaps therefore the angle in question is not that at the vertex of the cone, but that at the base; cf. “make a more acute angle with the circle” in 6.45. One may however suspect that Theophrastus has simply been misled by the geometrical fact that, *for a cone of a given height*, the smaller the base the more acute the angle at the vertex, and hence the smaller any intermediate circle at a given distance from the vertex (cf. figure 3). But there seems no reason why we should suppose that the cones involved are of equal height.

5.39-40 πλεονάκις ἐν τῷ αὐτῷ γίνεσθαι κατὰ τὸν ἴσον χρόνον] If this refers, as seems most natural, simply to the time taken to complete each revolution, we have a reference to the speed of running *independent* of the angle of leaning; compare above, on 4.34. However, from the three successive occurrences of “in the same place” in lines 37, 39 and 42 it looks uncomfortably as if Theophrastus has simply failed to distinguish clearly between (i) rotation *at a single point*, or what approximates to it, as having a particularly strong stirring effect on the brain, and (ii) arriving repeatedly at a particular point *on a circular path* (see fig.4).



(i)



(ii)

Fig.4

S anticipates Grangerius in the correct accentuation ἴσον in 32: this is simply an intelligent correction, for not only A, but also V^aRVBz, the Aldine, Furlanus and Heinsius have the impossible ἱσον.

5.40 τοῖς μακροτέροις δὲ μᾶλλον ὅσῳ ἐγκλίνουσιν] It is not immediately clear from the Greek text exactly what Theophrastus says

happens more to tall people.⁵⁰ It could be (i) “turn their head (more) in the same place” from 37, meaning “move their head around a smaller circle”, or (ii) “they are in the same place more often in an equal time” from 39-40—if indeed Theophrastus distinguished between these two possibilities clearly at all: see above. But (ii) is wrong: even though the taller person’s head moves in a smaller circle for a given angle of inclination, it doesn’t follow that it is in the 10 o’clock position, say, any *more often* than the shorter person’s, provided that their feet are going round the circle at the same speed. It is *angular* velocity that is relevant here, not the distance traversed.

The reference to leaning is also ambiguous. It is true that, as figure 5 shows in a highly exaggerated way, if a short and a tall person lean equally, the taller person’s head is nearer the centre of the circle than the shorter one’s (or, putting it another way: E describes a smaller circle than B), and that this is the case because “the taller person has his head closer to the vertex of the cone”.

The Greek might seem rather to imply that the taller person leans *more*; the thought might be that he does so in order to lower his centre of gravity and thus reduce the effect of centrifugal force.⁵¹ His head is then “nearer the vertex of the cone”, though, as fig. 6 shows, this will at least in part be because the vertical height of the cone is reduced. However, as already indicated, there is a question how far

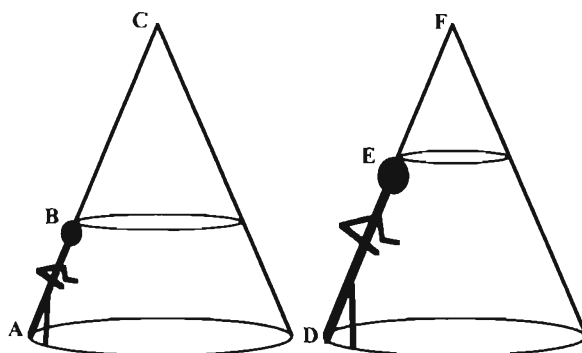


Fig. 5

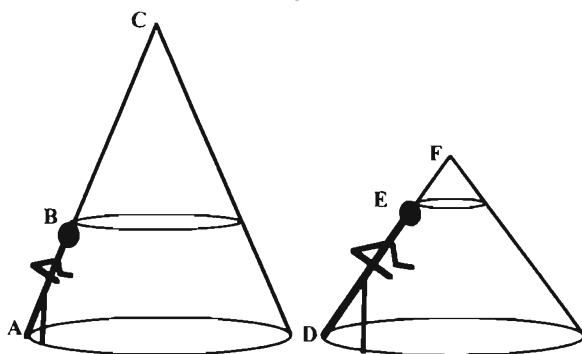


Fig. 6

⁵⁰ I am grateful to Bill Fortenbaugh for pressing me on this point.

⁵¹ I am grateful to Bill Fortenbaugh for this suggestion.

Theophrastus allows for interaction of this sort between the various factors he discusses, and in particular how far physical considerations like the height of the centre of gravity are considered;⁵² and it seems safer to suppose that “inasmuch as they lean” is simply pointing out that the discussion is still in terms of a cone.

The question again arises how far the implied claim that tall people become more dizzy is based on actual experience of dizziness, and how far it is an inference from the geometry of the cone, perhaps indeed demonstrated by moving a piece of wood on the end of a string, or something of the sort.⁵³ The assumption that tall people become dizzy more easily might indeed be based on a connection between dizziness and extended distance like that indicated in [Aristotle], *Problem* 3.20 (see below on 7.57-58); tall people have their heads further from the ground and so, it might be thought, the effects of movement on them will be greater. But if so, Theophrastus’ answer to the problem, in terms of the circle traversed being smaller, is at odds with the thought that might have given rise to its being posed in the first place.⁵⁴

Ald.’s replacing of μακροτέροις “taller” by μαλακωτέροις “more feeble” may be not just a slip but an attempt to make sense of the passage; it might after all seem *prima facie* plausible that feeble people would find it harder to remain upright—though in fact, since we are speaking of deliberate leaning over to counteract the effects of centrifugal force, unfit or feeble people might actually lean *less*.

B’s marginal correction ἐγκλίνουσιν is clearly right. It was taken up by Furlanus and Heinsius, but not by S or Ald., even though the transmitted ἐγκλείουσι makes no sense. Grangerius has ἐγκλείουσι in his text but *inclinantur* in his translation. Similarly, B’s marginal ὁ was taken up by Grangerius, Furlanus and Heinsius, but not by S or Ald.

5.42-43 ἐν τῷ αὐτῷ ... ἔσω ἔχοντα τὴν κεφαλὴν] I am grateful to Bill Fortenbaugh for suggesting this translation. “inwards” renders Schneider’s conjectured ἔσω. Neither the transmitted reading εἰσιν (unaccented in A: εἰσὶν in the other MSS, including S, and in Ald.; Schneider 1818-1821, vol.4 p. 774, Burnikel 1974, p. 49) nor ἴσην

⁵² See above, on 5.38.

⁵³ I am grateful to Sabine Vogt for this suggestion.

⁵⁴ I am grateful to Anthony Gordon for discussion of the issues in this paragraph.

(a marginal correction in B, but also present in V^aO [Burnikel, loc. cit.] and adopted by Grangerius, Furlanus and Heinsius) makes sense; but simply to delete the word, with Schneider in his actual text, followed by Wimmer, fails to explain how it got into the text in the first place.

6.44 <οί> εἰς τὰ ἀρίστερα θέοντες ἔτι μᾶλλον ἔσω νεύουσι] This answers another problem raised in §3: why do you get more dizzy if you run anti-clockwise? Theophrastus seems to reply that the left side of the body is weaker, and so when it is on the inside you lean inwards more; the head then, as fig. 6 above shows, describes a smaller circle even though the size of that traversed by the feet is the same. The superiority of the right-hand side of the body and inferiority of the left-hand side is indeed standard Peripatetic doctrine, illustrated by Aristotle, *Progression of Animals* 4 706a5 ff. by the fact that ancient Greek soldiers, like soldiers ever since, stepped off with the *left* foot—for it is the foot that remains stationary that does the pushing and starts off the movement. And there is evidence to suggest that the left leg is in actual fact favoured for support, the right for voluntary activity.⁵⁵

If this *is* the explanation of the greater dizziness that comes from running anti-clockwise, it may not be as odd as it sounds. In the ‘Last Word’ column of the *New Scientist* for 7th October 1995, p. 105, answers from readers to the question why people stagger *to the left* when leaving bars included the claim that the right leg is stronger than the left. This also explains, it was alleged, why people lost in the desert walk in anti-clockwise circles. Races on running tracks are always run in an anti-clockwise direction, both in the northern and in the southern hemispheres. And there is empirical evidence in aircraft pilots for a natural tendency to swerve to the left.⁵⁶

Whether turning to the left actually produces more dizziness than turning to the right, I do not know. It may be that the sensation, when

⁵⁵ Previc 1991, pp. 308-310; I am grateful to Anthony Gordon for this reference. It might indeed seem to conflict with the point about stepping off with the left foot made immediately before; but it is the right leg that performs the voluntary action of pushing the body forward, and at the end of the first step the left leg reacts automatically, as it were, by supporting the weight transferred to it.

⁵⁶ Ranken 1920, p. 861 reports that of a sample of 71 right-handed pilots 29 said they preferred turning left, 12 right, and 30 were indifferent; the left-handed sample was too small for any conclusions to be drawn. (I am grateful to Anthony Gordon for this reference.)

turning to the right, that one is going against one's natural inclination gives a greater subjective feeling of still being in control; but one may suspect that the Peripatetic belief in the superiority of the right-hand side, rather than actual experience, is the starting-point of the whole discussion.

Moreover, where we might expect Theophrastus to say that the right-hand side of the body is *stronger*,⁵⁷ he in fact says that it is more *weighty* (ἐμβριθής). This seems beside the point, for while added weight on the right-hand side might reinforce a leftwards lean once it was well enough established, it would seem that it would even more effectively reinforce the rightwards lean of someone running clockwise. It might indeed be supposed that those running anti-clockwise lean leftwards even more to counteract the natural tendency to fall to the heavier, right-hand side; but this too seems beside the point, since the important question is not whether they need to make more *effort* to lean inwards, but whether they in fact end up leaning inwards more once all the forces are taken into account. It is more likely that, as Bill Fortenbaugh has suggested to me, Theophrastus here confuses weightiness, or sturdiness, with strength.⁵⁸

Grangerius adds from Photius the words “those who run turning to the left <become more dizzy than those to the right> because (reading ὅτι for ἔτι) they incline inwards more”. But the sense is clear enough without the addition, and it is not clear that we should go against the MSS of Theophrastus. (Cf. above on 3.27.) Photius' προσβιάζεται is adopted against προσapoβιάζεται of A, the other MSS and Ald. by all editors from Furlanus to Wimmer inclusive (but not by Grangerius); once again, it is not clear that the change is necessary. ἐντὸς in Photius, adopted by Schneider, is however clearly right. ἐν τοῖς of A and the other MSS (including S and Ald.) makes no sense; B's marginal αὐτοῖς, adopted also by Grangerius, and Furlanus' αὐτοὺς, adopted by Heinsius, are innocuous (taking προσapoβιάζεται as passive with the former, middle with the latter) but add little to the sense.

⁵⁷ As is pointed out by de Baillou 1734, p. 289.

⁵⁸ Furlanus translates ἐμβριθέστερα by *robustior*, but Grangerius (followed by de Baillou) has *graviores*.

6.47 ἐὰν [μὴ] μετὰ πολλῶν θέωσι] The transmitted text has a negative, “if they do not run in company with many”, which makes no sense with the following “than if (they do so) alone.” The negative was marked for deletion by the second hand in A, and also in B, but is nevertheless retained in other MSS (including S and Ald.). It was however omitted by editors from Furlanus onwards. It is also omitted by Photius, but his subsequent inclusion of a negative in “not being continuous” may suggest he found a negative in the margin of his copy and misplaced it. Cf. Burnikel p. 69 n. 62 and p. 132.

6.48-50 καὶ ἡ ὄψις αὐτὴ προσβάλλουσα τοῖς θεοῦσι καὶ συνεχῆς οὖσα τῷ ἐγκεφάλῳ ποιεῖ τινὰ κίνησιν ἑτέραν καὶ ταραχήν] Stephen White suggests that the point at issue here is the conflict between the moving runners (who appear to be stationary) and the fixed surroundings (which, relative to them, appear to be moving). But I suspect this may involve a more sophisticated view of relative motion than is actually present in this passage, and that Theophrastus is simply anticipating the principle of §7 that looking at what is turning produces disturbance in the brain; looking at lots of runners who are all turning will therefore produce more disturbance. It is true that, as White points out, §7 *can* itself be read in terms of the conflict between what is apparently fixed but actually moving (the boat) and what is actually fixed but apparently moving (the stars); but this point is not explicit there. Anthony Gordon has pointed out to me that there is reason to connect agoraphobia with problems of balance and orientation, and that in some cases agoraphobia is worse in crowded places where there are many people moving and thus making it even harder to achieve a fixed reference point.⁵⁹

Schneider 1818-1821, vol.4 p. 774 and vol.5 p. lviii, followed by Wimmer, adds ἐν after οὖσα from Photius “in case,” he says, “anyone should take συνεχῆς with ἐγκεφάλῳ”, i.e. construe it as “being continuous with the brain”, rather than understanding the text as “... (doing so) continuously, produces a certain further movement and disturbance in the brain.” But even the addition of ἐν does not force the reader to take ἐγκεφάλῳ with ποιεῖ (the sense could still be taken as

⁵⁹ See Gordon 1986, with further references, and the reply by Jacob et al. 1986; also Brandt 1999, p. 460.

“being continuous *in* the brain”). And in any case it is not clear that we should *not* take συνεχῆς with ἐγκεφάλῳ; the objection to doing so is presumably that it implies a non-Aristotelian view of the anatomy of the brain and sense-organs, but Theophrastus’ whole argument here seems to do this in any case (see the next note). As Stephen White points out, συνεχῆς is used for physical continuity within the brain at 76, and continuity of action is indicated in 53 and 69 rather by the adverb συνεχῶς.

6.50-51 ἀπὸ γὰρ τῶν ἔξω διαδίδονται καὶ πρὸς τὰ ἐντός] This presupposes some connection between sight and the brain. Aristotle, connecting sensation with the heart rather than with the brain, wavers on the question whether there is any connection between the eyes and the brain; at *HA* 1.16 495a13 he refers to a passage (πόρος) from the eye to the brain itself,⁶⁰ but elsewhere he refers to the sense-organs in the head being connected rather with the blood-vessels around the brain, which as Clarke notes suits the view that sensation operates through the blood-vessels leading to the heart and is not connected with the structure of the brain itself.⁶¹ And at *PA* 2.7 652b Aristotle states that there is no continuity (συνέχεια) between the brain and the sense-organs.⁶² At *HA* 2.11 503b15 the chameleon’s brain is said to be συνεχῆς with its eyes,⁶³ but this is in a passage which has been thought to be a Theophrastean addition to the *HA*.⁶⁴

7.56-57 οἱ τε γὰρ πλείοντες θάπτων καὶ μάλλον ἰλιγγιῶσιν ὅταν ἐμβλέπωσι τοῖς κύμασι] The modern recommendation to avoid sea-sickness is to look at the horizon, in order to provide a fixed point of reference to counteract the effects of the movement (see above

⁶⁰ Clarke 1963, p. 3 n. 16.

⁶¹ *GA* 2.6 744a5; Clarke 1963, p. 8 and n. 49. At *HA* 1.11 492a21-22, also noted by Clarke loc. cit., Aristotle says that the eyes are connected with the brain, but also that each is on a blood-vessel; and this follows immediately after the statement that there is no πόρος from the ear to the brain, but there is a blood-vessel leading from the brain to the ear.

⁶² Clarke 1963, p. 8 n. 50.

⁶³ Clarke 1963, p. 4 n. 18.

⁶⁴ Cf. Sharples 1995, p. 92 n. 282, and the references there. Vogt 2002 notes Theophrastus’ report at *De sensibus* 26 of Alcmaeon’s assertion of a connection between the eyes and the brain.

on 6.48-50). Theophrastus' reference to looking at moving objects is ambiguous, for the reference could be either (i) to objects which are stationary but appear to move because the boat is moving, or (ii) to objects which are also in motion themselves: Theophrastus' recommendation is after all that those on board should cover themselves up and not look at anything at all. (They are presumably passengers rather than sailors.) The reference to *waves*, rather than just to "the sea", supports (ii). That to "the movement of all the stars" is less clear: Anthony Gordon points out to me that fixing one's gaze on a single star would provide a stable point of reference to exactly the same extent that looking at the horizon would—both would appear to move relative to the boat, because of the boat's rocking—while looking at *all* the stars could increase disorientation.⁶⁵ On the other hand, the text refers to the movement of the stars, rather than, in the first instance, to that of the person's sight; and it is just as true of the stars as a group as it is of each individual star that the apparent movement that might create or enhance dizziness is that resulting from the movement of the boat.⁶⁶

[Aristotle], *Problem* 3.20, which combines the point of this section with those of §8 and §12 below, asserts that anything which extends for some distance moves in a circle, citing masts and suspended objects as an example; the idea might be that such objects are liable to vibration in themselves, but it might also be that the rocking of the boat is magnified if one looks at the top of the mast. The height of the mast does not in fact increase the movement of its tip relative to the person on the deck, who is rocking with the boat; but the suggestion may be that the tip of the mast is being seen against some relatively fixed point of reference, such as a mountain or a cloud.

7.59 οἱ τὰς αἰώρας καὶ τοὺς τροχοὺς θεωροῦντες] This passage is echoed by Archigenes and Galen, who are discussing dizziness in general to throw light on the condition of people who are unusually prone to it. Archigenes says that dizziness caused by looking at rotating wheels⁶⁷ is caused by the "visual πνεῦμα" rotating with the

⁶⁵ Schneider in his commentary suggests deleting "all". But it is difficult to see how the word could have intruded into the text.

⁶⁶ Schneider 1818-1821, vol.4 p. 774 comments with some justice that he does not know what movement of the stars (themselves) could be so rapid as to cause dizziness.

⁶⁷ I am told that the opening image of Hitchcock's film *Vertigo* is a rotating wheel.

object. Presumably he is employing the Stoic theory of vision, according to which vision was explained by a tensioned cone of πνεῦμα with its apex at the eye contacting the object at its base.

That was not Aristotle's or Theophrastus' explanation of vision. Nevertheless, what is said by Theophrastus himself both here and in §8 seems to imply some material extension from the eye in the process of vision. Here he refers to the "sight", ὄψις, moving in a circle;⁶⁸ in §8 he refers to "sight" being stretched out and vibrating. One *might* try to explain what is said in §7 in terms of the eyes themselves tracking the motion of the revolving object; but §8 seems rather more definitely to imply something extending from the eye and being shaken outside it.

This is not however as un-Aristotelian as it might seem.⁶⁹ In *On the Soul*, indeed, Aristotle argues that vision takes place through an effect on the transparent medium that involves no physical movement from the thing seen to the eye or vice versa;⁷⁰ but elsewhere he speaks of sight as

Vertigo due to visual disturbance is discussed by Brandt 1999, pp. 409ff.: he refers to the effect of looking at clouds and moving water (pp. 409, 424) and to motion sickness produced in healthy people by looking at moving objects with no fixed point of reference, including the inside of a rotating cylinder and wide-screen movies (pp. 417-418). At p. 409 he quotes the following noteworthy passage from the *Zoonomia* of Erasmus Darwin (1731-1802: I am grateful to Anthony Gordon for directing my attention to this work):

Many people, when they arrive at fifty or sixty years of age, are afflicted with slight vertigo: which is generally but wrongly attributed to indigestion, but in reality arises from a beginning defect of their sight ... these people do not see objects so distinctly as formerly, and by exerting their eyes more than usual they perceive the apparent motions of objects, and confound them with the real motions of them: and therefore cannot accurately balance so as easily to preserve their perpendicularity by them.

⁶⁸ I have translated ὄψις by "sight". The Greek word has a specific application to the "visual ray" supposed to proceed from the eye in many ancient theories of vision. But that is not its only meaning, and given the lack of clarity not only about the nature of what proceeds from the eye in Theophrastus' theory, but also and more specifically about the mechanism by which disturbances to this are supposed to create disturbances in the head, it seems preferable to adopt a more general translation.

⁶⁹ Grangerius 1576, p. 41 recto, cited by Schneider 1818-1821, vol.4 p. 775, describes Theophrastus' theory of vision here as Platonist.

⁷⁰ Aristotle, *On the Soul* 2.7. Alexander of Aphrodisias indeed uses the claim that our vision is not affected by wind or by movement in the depths, as opposed to the surface, of water as an argument against theories of vision involving physical movement of something from or to the eye: *mantissa* 129.21ff. (projection of rays from the eye); *ibid.* 135.32ff., *in de sensu* 57.10-11, 57.26 (the Atomist theory of images travelling from the

if it were something physical issuing from the eye.⁷¹ In *Meteorology* 3.4 373a35 he refers to our “sight”, ὄψις, being reflected from smooth surfaces.⁷² It might seem possible to regard this in itself as a *façon de parler*, a way of expressing the geometrical facts which need not be explained in terms of any sort of material body travelling to or from the eye or extending from it,⁷³ but this is more difficult when Aristotle goes on to speak of a man whose sight was so weak that it could not push aside the air in front of him, which thus became a mirror so that he saw himself facing towards himself in front of himself as he walked.⁷⁴ And in *De caelo*, 2.8 290a17ff. Aristotle explains the claim that the sun seems to rotate at rising and setting, and also perhaps the twinkling of the stars, by saying that our sight is weak and wavers when extended to long distances, and indicates that the seen object seems to move though in fact it is our sight that does so, the apparent effect being the same. It seems

object to the eye). I am grateful to Alan Towey for pointing this out.

⁷¹ For what follows cf. Preus 1968, pp. 177-8; Lindberg 1976, pp. 217-18 n. 39; Simon 1988, p. 49; van der Eijk 1994, p. 189; Jones 1994, especially pp. 60-72; Berryman 1998, pp. 184-186. Preus argues that Aristotle had an earlier theory of vision involving emanation from the eye, replaced in the *De anima* and *De sensu* by one that denies any physical movement, noting that *De gen. an.* 781a3-8 allows both theories; so too Simon 1988, p. 50. Lindberg, loc. cit., agrees with Preus in recognising a change in Aristotle's views over time; when Lindberg comments that it is “the universal teaching of Aristotle's psychological works that sight does not occur through the extension of an ocular ray”, *psychological* is presumably to be emphasised. I am grateful to Thomas Johansen, Philip van der Eijk, Pamela Huby and Victor Caston for bringing the primary and secondary literature on this issue to my attention.

⁷² Vision being thought of, as it was later by Ptolemy in his optical investigations, as proceeding from the eye to the object rather than the reverse; the geometry is unaffected.

⁷³ Cf. Simon 1988, loc. cit. Jones 1994, pp. 60-61, notes that Alexander, *In Meteor.* 141.3-30, on 3.2 372a29, explains Aristotle's talk of our vision being reflected as the use of terms which are in common use and acceptable to mathematicians, rather than an expression of his actual doctrine; similarly, coupled with a desperate attempt to explain ὄψις as referring to the transparent medium, Alexander ap. Simplicius, *In De caelo* 453.34-454.14, on 290a17ff. (below). Galen, conversely, criticises Aristotle for his ambivalence on the issue (*On the Doctrines of Plato and Hippocrates* 7.7.10-15, *CMG* vol. 5.4.1.2 p.473.3-24 De Lacy).—At Aristotle, *On Dreams* 2 460a1 it is the ὄψις of a menstruating woman that is said to discolour a mirror she looks at (again, I am grateful to Thomas Johansen for drawing my attention to this passage. Cf. Preus 1968). But in what follows it becomes clear that the eye is thought of as affecting the intervening air (460a9), rather than anything physically travelling from the eye to the mirror. On this passage cf. also Sprague 1985, pp. 323-5; van der Eijk 1994, pp. 183-193.

⁷⁴ Aristotle, *Meteorology* 3.4 373b3.

difficult here to interpret talk of our sight *moving* and *wavering* otherwise than in terms of some sort of physical transmission or extension.

There are moreover similar ideas in some of the [Aristotle] *Problems*. *Problem* 3.9 explains the apparent rotation of objects when one is drunk by saying that our sight naturally moves in a circle because it is a cone with a circular base. This *could* be understood just in terms of our eyes rolling, and hence also the direction of our gaze, but the language hardly suggests this.⁷⁵

If the description of vision in terms of physical movement or extension occurred only in Theophrastus and the *Problems*, and not at all in Aristotle, it might have seemed that we had here another case, like those that have been suggested elsewhere, of Theophrastus' concern with the details rather than the general picture leading him into an un-Aristotelian position without his perhaps fully realising the fact.⁷⁶ Equally, if such ideas had occurred only in Theophrastus and in works of Aristotle earlier than *On the Soul*, it might have been supposed that *On Dizziness* was written by Theophrastus in an early period of both his and Aristotle's careers. But in fact, whatever the date of *On Dizziness* itself, since the physical theory of sight is present in the *Problems* too we in any case have a disregarding, whether deliberate or unconscious, of Aristotle's view in *On the Soul* by subsequent members of his school,

⁷⁵ Berryman 1998 notes that the *Problems* refer to ὄψεις in the plural rather than ὄψις in the singular, and interprets this in terms of the theory of rays forming a cone; she also notes that Theophrastus in our text does *not* refer to vision forming a cone, even though he has previously mentioned cones in the context of dizziness caused by spinning, and argues that, while Theophrastus here speaks of movement in what is looked at causing disturbance in the head through the visual ray, and in §11 simply of internal disturbance due to drunkenness, *Problem* 3.9 has a more elaborate theory according to which rotation of the cone of visual rays makes stationary objects appear to rotate, because different rays in the rotating cone fall upon the object successively. That our sight is a cone is asserted in *Problem* 15.6, but for optical rather than physical reasons, the conical geometry of sight being used to explain why patches of sunlight projected through a square mesh, as of wickerwork, appear circular. It is argued that our sight, being conical, is too weak to pick up the corners of the square patches. (On this cf. also Jones 1994, p. 72.) Alexander, or pseudo-Alexander, also accepts in the *mantissa* (146.18ff.) that sight is a cone with the vertex at the eye and the base at the object, but in a geometrical, not a physical sense (contrast *ibid.* 129.9ff., and 130.14ff. against the Stoics).

⁷⁶ Cf. Gottschalk 1964, and also Gottschalk 1967, pp. 25-26.

even if Theophrastus' *On Dizziness* was earlier.⁷⁷ Moreover, as Philip van der Eijk has pointed out to me, in the case of Aristotle himself too it may be appropriate to think not so much of a development in his views over time as of a failure to examine the relation between the general theory and the explanations advanced in the context of particular problems; he notes that in *Generation of Animals* 5.1 781a3-12 Aristotle mentions both the theory of vision in *On the Soul* and the theory of ὄψις issuing from the eyes, but says both are equally able to explain why creatures with sunken eyes can see better at a distance.

7.61-62 κινεῖν τὰ ἐντὸς ἀνωμάλως καὶ ταραττεῖν] B's correction καὶ ταραττεῖν ἀνωμάλως and Grangerius' καὶ ταραττεῖν ἀνωμάλως are disregarded by S, Ald., Furlanus and Heinsius.

8.63-65 ἰλιγγιῶσι δὲ καὶ οἱ τὰ ὑψηλὰ καὶ τὰ μεγάλα καὶ ἀπότομα ἀποβλέποντες διὰ τὸ συμβαίνειν μακρὰν ἀποτεινομένην σείεσθαι καὶ κραδαίνεσθαι τὴν ὄψιν] One might think that this referred to vertigo when looking *down* from a great height, and Wimmer's 1866 translation has "look down", *despiciunt*, for ἀποβλέποντες in 64. But, apart from the fact that the Greek does not explicitly refer to looking downwards, there are two difficulties with this interpretation. First, symmetry would then suggest that the looking upwards referred to in the second part of §8 is looking upwards at tall buildings or mountains. But what is then being explained is why we do not become dizzy when we look upwards at something high; and arguably in fact we do, especially if it is a tall building with clouds moving behind it. Secondly and more decisively, Theophrastus explains the claim that we do not become dizzy when looking upwards by saying the light cuts short our extended "sight". Whatever exactly that "sight" is, it is hard to see how, in that case, the people can still *see* the tall things they are looking at, whether doing so makes them dizzy or not. If on the other hand the reference in 66-68 is to looking vertically upwards into, as we would say, an empty sky,⁷⁸ it may be reasonable to suppose

⁷⁷ Berryman 1998 notes that some later surveys of theories of vision, in Geminus ap. Damianus, *Optica* p.24, and Calcidius, *On Plato's Timaeus* 238, do not mention the theory of Aristotle's *On the Soul* at all. Alexander, not surprisingly, loyally does so: Alexander, *De anima* 42.4-46.19, *mantissa* 141-147. See above, n. 73.

⁷⁸ So Furlanus 1605, p. 264; de Baillou 1734, p. 291; Jones 1994, p. 65.

that we are not actually seeing very far.⁷⁹ If this interpretation of 66-68 is correct, 63-66 may be referring both to looking upwards and to looking downwards; indeed “high and tall” may suggest the first, “steep”, or “precipitous”, the second. The parallel in [Aristotle], *Problems* 3.20, discussed above in connection with 7.56-57, is not close enough to help here, for it simply refers to looking at things a great distance away, and not specifically to looking upwards or downwards; indeed it combines the issue of distance with that of looking at a moving object, mentioned in §7 here, in a way that suggests that the *Problem* is secondary and Theophrastus’ essay primary.

There is in any case a problem; why do we not become dizzy when we look at distant objects horizontally? For our sight is “stretched out to a great length” then just as much as when we look upwards or downwards.⁸⁰

As Jones points out, the reference to light cutting our sight short is to be connected with the principle that a greater light overpowers a lesser; cf. Theophrastus, *On Sensation* 18, *On Fire* 11; Aristotle, *On Dreams* 461a1; [Aristotle], *Problems* 31.28 960a24ff.⁸¹

In 63 B has the correct ἰλιγγιῶσι (“become dizzy”) in the margin, but as a paraphrase rather than a correction; neither S nor Ald. have followed it. In 65-66 A has σειομένην δ’ οὕτως καὶ κινουμένην ταραττει καὶ κινεῖ, which gives the wrong sense (“the inside parts disturb and move the sight which is shaken and moved in this way”, when what is required is the reverse). The choice is between reading σειομένη δ’ οὕτως καὶ κινουμένη ταραττει καὶ κινεῖ with Photius, or σειομένην δ’ οὕτως

⁷⁹ The [Aristotle]/[Alexander] *Problemata inedita* indicate this by “where will our sight go and be carried?” (So Bussemaker 1857. The emended text of Usener 1857, indicating that our sight will “find a place to rest, going where the sun appears”, has no basis in the MSS.) Anthony Gordon suggests that the true explanation for dizziness caused by looking at objects far below or above one is that it is harder to achieve precise points of visual reference at a distance, and a situation of positive rather than negative feedback may result—that is to say, where normally we compensate for perceived movements taking us off-balance, when this process of correction goes awry there is a tendency to increase disequilibrium. When looking upwards into an empty sky, however, there are no reference points to generate positive feedback. The issue is discussed by Brandt 1999, pp. 418-423.

⁸⁰ I am grateful to Andrew Gregory for pointing this out. (Presumably the reason why we are not in fact made dizzy in such cases is that our vertical axis is the crucial one where balance is concerned; see the previous note.)

⁸¹ Jones 1994, p. 65.

καὶ κινουμένην ταραττειν καὶ κινεῖν with B's interlinear correction (followed by Grangerius, Furlanus and Heinsius, but not by S or Ald.); but the infinitive construction, though possible, is clumsy, and corruption of σειομένη δ' οὕτως καὶ κινουμένη to σειομένην δ' οὕτως καὶ κινουμένην can easily be explained by the accusatives in the previous clause. In 67 Schneider's retention of ὧς as a demonstrative is ingenious, but it is not clear that the use of this word-form is Theophrastean.

9.69 γίνεται δ' ἴλιγγος καὶ ὅταν εἰς τὸ αὐτὸ βλέπωσι συνεχῶς] This is explained as due to the fact that the regular movement of the fluid in the head can be disturbed by part of it being at rest, as well as by part of it moving too violently. In 70 Stephen White argues for retaining A's εἰ against the vulgate "why the same experience comes about when the sight is moved in a circle and also when it is at rest"; εἰ is the *lectio difficilior*, and that it is not simply a careless mistake is shown by the fact that A has a raised point of punctuation after ὅψεως. In 74 there is no need to add χωρίζει with Marcovich: καὶ gives a good sense as it stands—being at rest *too* causes separation, as did excessive movement in §§ 1-2.

9.75 τῆς ὀψεως δὲ στάσης ἐνὸς μορίου] Or perhaps, with ἐνὸς μορίου understood as in apposition to τῆς ὀψεως, "when the sight, (that is) a single part of it, comes to rest": so Wimmer.

9.77 καταβαρύνει] Anthony Gordon suggests "they create pressure", and the Greek could in itself mean this; but the context suggests that the thought is rather of the disruption of a regular movement, as in §1 above.

9.79-80 εἰ δε μή, καθάπερ Ἡράκλειτός φησι, καὶ ὁ κυκεῶν δίσταται κινούμενος] Theophrastus' general argument in §9 is clear enough. It is illustrated, however, by a reference to a saying of the proverbially obscure Presocratic philosopher Heraclitus, as a result of which this section has prompted more discussion in recent years than the whole of the rest of Theophrastus' essay.

Reports of Heraclitus fr.125 appear in two texts; ours, and what we now know as the [Aristotle]/[Alexander] *Problemata inedita*. In the latter Heraclitus is reported as saying, with the text as emended by Usener and with the reading of MS M rather than of B, "the posset, if no-one stirs it

up, separates”.⁸² A posset, *κυκεών*, was a mixture of wine and grain that could only be drunk as a mixture if kept together by stirring; otherwise it would separate. (Forster indeed argued that the reading *κυκλεών*, in the MSS of [Alexander], was to be preferred in our text too; Heraclitus’ saying would then have nothing to do with possets, but would be an example of the characteristic Heraclitean combination of opposites, asserting that a person turning round on the spot is stationary, though moving, unless pushed off his position. The point that rotation combines motion and rest sounds suitably Heraclitean, and is made explicitly by Plato, pupil of the Heraclitean Cratylus, at *Republic* 436d; but the reference to not being pushed away from one’s position seems rather forced and unnecessary.)⁸³

The text of Theophrastus, as transmitted, gives “if not, the posset separates if it is moved”. But on the face of it the statement that the posset separates if it is moved is neither true, nor to the point in the text of Theophrastus; it also conflicts with what the [Aristotle]/[Alexander] *Problemata inedita* report Heraclitus as saying, at least as emended by Usener. Hence the insertion here by Bernays 1848, pp.6-7 (= 1885, vol.1 p.6), followed by Usener 1859, on the basis of the reading of cod. M in the *Problemata inedita*, of “not” to give “the posset separates if it is *not* moved”. Heraclitus will then be using the example of the posset to assert the paradox that motion can preserve and rest destroy, attested in other fragments too,⁸⁴ and the sense, with the MSS *ἄλλοτε* in 78, might be: “certain things which are naturally such as to move sometimes stay together on account of this movement;⁸⁵ if these things are sometimes not

⁸² *κἄν μεταράττη* in MS B of [Alexander] would have to be taken as second person singular middle: “even if you disturb it”. But there seems no particular reason for the middle voice, and no part of *μεταράττειν* occurs in LSJ or in the *TLG* index.

⁸³ It could perhaps be explained away as a later addition, especially if the *Problemata inedita* are dependent on Theophrastus (see below) and *κινούμενος* in the latter is a mistaken addition (whether introduced by Theophrastus himself or not) resulting from a corruption of *κυκλεών* to *κυκεών*. For it would be easier for the addition to be made at the end of Heraclitus’s saying, in Theophrastus’ version, and then transferred to the middle of it, as in the *Problemata inedita*.

⁸⁴ Cf. Heraclitus fr.53 and fr.80 DK, and the report at Aristotle, *Eudemian Ethics* 7.1 1235a25-9.

⁸⁵ André Laks points out to me that possets do not move naturally; they need to be stirred. But I think we can regard the posset as “naturally constituted to move with this movement” in the sense that its very nature not only admits of the movement but indeed depends on it. (I am grateful to Konrad Steiger for this point.)—Nevertheless, this raises a

preserved because they are sometimes not moving, well, the posset too comes apart when it isn't stirred," so that "if not" is contrasted with "sometimes" in the preceding clause "are sometimes also held together on account of this".⁸⁶ Alternatively, as Stephen White suggests to me, we might omit Bernays' "not" and take the sense to be "if what is naturally preserved by movement is not preserved, the posset too separates if it is disturbed", κινούμενος referring not to the stirring that keeps the posset together but to changing or disturbing it, for example by holding still, as in a fixed gaze, the stick with which one had previously been stirring. But it is then less clear what the point of the remark would have been in its original Heraclitean context.

It seems however more natural to take "if not" as questioning the general principle that what naturally moves is held together by movement and destroyed by rest.⁸⁷ The problem then is that the posset's coming apart when not stirred appears to *support* the principle, not to be an unacceptable consequence of its denial. And consequently Bernays and Usener followed Furlanus in emending "if not" to "if indeed."⁸⁸

Other solutions have been attempted. Forster preferred ἵσταται, the transmitted text in the *Problemata inedita*, to διίσταται "separates"; that is to say, he emended Theophrastus from the *Problemata inedita*, rather than vice versa. Reading κυκλεύων, as noted above, Forster understood ἵσταται in the literal sense of "stands still". Van der Ben, however, reading κυκεών, follows Forster in preferring ἵσταται, or ἐπίσταται,⁸⁹

further difficulty for this interpretation; "sometimes" is an odd way to refer to what is actually a necessary condition of the thing's existing in its natural state. Moreover ἄλλοτε means "sometimes" only by contrast with implied other times, which makes "are sometimes also held together on account of this" even odder; *whenever* the posset is held together it is held together on account of this. I have therefore accepted Mouraviev's ἄμα τε, for which he compares (1996, p. 34 n. 3) ἄμα εἶναι in 82 and 85.

⁸⁶ So Kirk 1954, p. 255. Cf. also Burnyeat (private communication) as quoted by Mouraviev 1996, p. 43.

⁸⁷ Mouraviev 1996, p. 43. I am also grateful to István Bodnár for emphasising to me the importance of distinguishing the two interpretations of εἰ δὲ μή.

⁸⁸ In 79 A has "δὲ μή", which is probably intended as δὲ μή, as Michael Sollenberger points out to me; nevertheless D, copied from A, and z have δ* μή (Burnikel 1974, pp. 63, 86), which suggests some uncertainty. BS, Ald., Grangerius, Furlanus in his text, Heinsius, Schneider and Wimmer all have δὲ μή, and Tiph. translates *si vero non*, but Furlanus in his commentary (p. 265) proposes μὲν δὴ.

⁸⁹ Forster had explained διίσταται in the text of Theophrastus as arising from an original δὲ ἵσταται, but van der Ben, while saying that the δὲ could come simply from

but argues that this should be understood in the sense of “preserves its nature”. The sense achieved will then be “the posset preserves its nature by being moved”. And this comes to the same thing as Bernays’ “the posset separates if it is not moved”; either way, stirring keeps the grains in suspension, ceasing to stir causes them to sink to the bottom so that the posset no longer preserves its nature.

But we still have the problem of the transmitted “if not”; for the paradox seems to *assert* the view that Theophrastus too puts forward, rather than to conflict with it.⁹⁰ Van der Ben therefore suggests that we are to understand “if not” as meaning, “if we are not to suppose that it is *downwards* movement of the heavy parts and consequent *separation* that preserves in *this* case, then the posset *too*”, i.e. as well as the brain, “is preserved by circular motion”. We are meant to *infer* from this that it is circular rather than downward movement that preserves the proper condition in the case of the brain. The connection with what precedes however seems difficult; why should we ever have supposed, *in this context*, that downwards movement and separation of the heavy parts did have a preserving rather than a destructive effect? Van der Ben indeed describes the sentence “For the things which are naturally constituted to move with this movement are preserved and stay together on account of it” as making a general point, that the movement that is natural for each type of thing is what preserves it. The problem is that on his own account, by referring to things that are held together by the downwards tendency, it states, not a general principle, but the case of it which does *not* apply in the case that concerns us.⁹¹ Or, putting it another way, is it

the original Heraclitean context, proposes to emend διῴσταται to ἐπίσταται as an Ionic form of ἐφίσταται, “halt” or “stop”.

⁹⁰ This is so whether we read the condition as saying “if what has been asserted is not the case, then, as Heraclitus says...”, or as “if indeed it is not the case that, as Heraclitus says...”. If “p” is the claim that motion can preserve, and “q” is the assertion made by Heraclitus, then the former gives “if not p, then q”, the latter “p, if not q”. These are logically distinct, but neither is compatible with q being a specific case of p.

⁹¹ There is a more general problem with the reference of “this movement”, too; even if we do not follow van der Ben, it is difficult to take it as referring to circular movement in general, for the general principle—applying to possets as well as brains—is introduced, if at all, only in this very clause, so that “this movement” so interpreted has nothing preceding it to refer to. It is more natural, therefore, to take it as referring back to “what is preserved when there is movement” in 74; and the consequence is that “the things which are naturally constituted” in 77-78 must be interpreted as referring specifically to

not it rather odd for the actual view Theophrastus is arguing for to be stated more obscurely and elliptically, in the final sentence only of §9, than the one he is rejecting?

Van der Ben was developing an interpretation by M.M. Mackenzie, who had suggested that *Heraclitus* wrote ἵσταται in the sense of “remains”, “preserves its nature”, but that Theophrastus wrote διῥσταται “separates” with a deliberate allusion to Heraclitus’ words while reversing their sense. Theophrastus’ claim is then that “if not, (i.e. if it is not true that certain things stay together on account of movement), then even the posset separates when it is stirred”—the point being that we all know, and know that Heraclitus knew, that it does *not*, so that Theophrastus has converted Heraclitus’ true observation of paradoxical behaviour into a falsehood to use in a *reductio*. The posset does not in fact disintegrate when stirred, rather the reverse; and no more does movement in general necessarily cause disintegration rather than persistence.⁹²

Against Mackenzie, Mouraviev shows that the version of the whole discussion in [Aristotle]/[Alexander] is (as Forster too had argued) dependent on Theophrastus, and that her claim that it preserves the original Heraclitean wording while Theophrastus altered it is therefore problematic.⁹³ Mackenzie is however right, Mouraviev argues, to interpret the context in Theophrastus as a *reductio*;⁹⁴ the versions in Theophrastus and in [Aristotle]/[Alexander] correspond, except that the latter has made into a straight statement what is a *reductio* in the former—in Theophrastus, “otherwise even the posset (would) separate when moved (but in fact it does not)”; in [Aristotle]/[Alexander] “the posset separates if not moved”.⁹⁵ But Mackenzie’s suggestion that Theophrastus

brain-constituents. See below, n. 106.

⁹² Mackenzie’s methodology, in reconstructing “the posset separates when it is stirred” as the form of the saying in Theophrastus but denying that it can be Heraclitus’, and van der Ben’s in attempting to insert Mackenzie’s version of Heraclitus into Theophrastus too, are both pointedly criticised by Mouraviev.

⁹³ Mouraviev 1996, pp. 41, 44.

⁹⁴ It has been suggested to me that Mackenzie’s interpretation would require a counterfactual with ἄν: “if not, the κυκεών *would* separate when stirred.” However Mouraviev 1996, p. 42 n. 19 concurs with Mackenzie’s view, pp. 546–547, that the counterfactual construction is not in fact required.

⁹⁵ Mouraviev 1996, pp. 41–43, suggesting that the different formulation in the [Aristotle]/[Alexander] text results from an attempt to remedy an accidental omission

converts a true though paradoxical statement by Heraclitus into a falsehood, while still attributing it to him as a statement, is awkward; it would have been easier if Theophrastus had written not “if not, as Heraclitus says, even the posset would separate when it is stirred” but something like “if not, even Heraclitus’ well-known posset would separate when it is stirred.”

One might wonder at this point whether interpreters have been underestimating Heraclitus’ love of paradox.⁹⁶ After all, that the posset separates if not stirred is obvious enough if one thinks about it. True, a paradox needs to trade on the obvious if it is to be a paradox.⁹⁷ But it is also the case that even a stirred posset will not last for ever; even the stability that consists in flux cannot be preserved indefinitely. Perhaps then Theophrastus’ point in quoting Heraclitus is to say that “motion (contrary to what might be expected) preserves certain things; if not, then, as Heraclitus says, even the posset separates in the end” (or “if it is not the case that, as Heraclitus says...”).

Approximately this interpretation was indeed already advanced by Schultz in 1909.⁹⁸ He tied it too closely, however, to the specific issue of the perishability of the heavens in the ἐκπύρωσις which he regarded as Heraclitean, and perhaps for this reason in particular incurred criticism by Kirk.⁹⁹ The point can however be given a more general interpretation; even the stability which results from change has its limits—a thought alien to the reading of Heraclitus by Kirk, for whom *the* striking thing about fire is “the *regularity* with which it absorbs fuel and emits smoke”.¹⁰⁰ But Kirk’s inclination is to *explain* paradoxes, which may mean explaining them away.¹⁰¹

An advantage of such a reading is that it gives a better sense to καὶ (“*even* the posset”), where on other interpretations we can only have “the

currente stilo.

⁹⁶ I am grateful to André Laks for suggesting this line of thought.

⁹⁷ Cf. Bambrough 1960, pp. 289-300; also Bambrough 1984, pp. 29-40.

⁹⁸ Schultz 1909, p. 202 and n. 15. Schultz’ interpretation is among those noted, and rejected, by Mouraviev 1996, p. 42 n. 24.

⁹⁹ Kirk 1954, pp. 255-6.

¹⁰⁰ Kirk, Raven and Schofield 1983, p. 199. Italics mine.

¹⁰¹ Compare his denying to Heraclitus the paradox “you cannot step into the same river twice” (fr. 91: cf. 22A6 DK) in favour of “upon those who step into the same rivers different and different waters flow” (fr. 12: Kirk, Raven and Schofield 1983, pp. 194-7). And cf. also Kirk 1961, pp. 105-17; Popper 1970, especially pp. 144-7 of the reprint.

posset too”, καὶ simply noting that it is a parallel example to the brain. For “*even* the posset disintegrates if it is *not* stirred” implies that possets are in principle more stable than most things, whereas in fact they are less so.¹⁰² On the other hand, the allusion to Heraclitus becomes less closely connected with the main point that Theophrastus is making; it becomes, apparently, in effect a throw-away line, a qualification which may be accurate but whose absence would hardly have been missed: “not even things preserved by motion can be *everlasting*...”. And this is I think the chief argument against such an interpretation; in reconstructing the text of Theophrastus we need not only to give a plausible account of what Heraclitus was saying but also to explain why Theophrastus chose to allude to it. In the context, to say, as this interpretation in effect does, that even stirred possets disintegrate in the end, is not just irrelevant to Theophrastus’ point but actually weakens it; his point is that rest can disrupt regular motion, and to say that even regular motion cannot last for ever (in sublunary things, anyway) is beside the point. (Looking fixedly at the same thing makes you dizzy, but it is hardly to the point to suggest that even if you don’t look fixedly at the same thing, you’ll still become dizzy in the end).¹⁰³

Alternatively, we might suppose, with Mouraviev, that the original context in Heraclitus too was counterfactual; that is, that Theophrastus is attributing to Heraclitus not just “the posset separates when moved” but the whole of “otherwise even the posset (would) separate when moved (but in fact it does not)”.¹⁰⁴ And that is the rendering I have in the end adopted in my translation.

10.81-83 εἴη δ’ ἂν καὶ τῇ κυκλοφορίᾳ τὸ αὐτὸ τοῦτ’ ἀποδιδόναι· δίστησι γὰρ ἡ δίνη τὰ βαρέα καὶ κοῦφα δέον ἅμα εἶναι τὰ μὲν εἰς τὸ μέσον ἄγουσα τὰ δ’ εἰς τὸ ἔσχατον]
The idea of an undesirable separation, linked in §9 with rest resulting from fixed gazing, is now extended to the cases of circular movement and of stooping down as well. In the first case it is not clear how this relates to the *regular* movement that preserved the proper state of affairs

¹⁰² Cf. Mackenzie 1986, pp. 547-8.

¹⁰³ It may also be added that this interpretation is incompatible with reading ἄλλοτε in 63; that the posset disintegrates in the end does not show that things are not held together by movement *sometimes*.

¹⁰⁴ Mouraviev 1996, pp. 42-3.

and *avoided* dizziness in §9, but presumably the point is that regular movement is disrupted both by rest and by other movements¹⁰⁵—though it has to be admitted that there was no suggestion in §§1-2 of regular movement in the brain being desirable or even possible. Mouraviev (1996) 39-40 however suggests rather that there is a differentiation between constituents of the brain, some being kept together by regular motion, others by rest, and interprets “the things which are naturally constituted to move with this movement” in 77-78 as indicating a differentiation between some parts of the brain and others.¹⁰⁶ He further notes that the [Aristotle]/[Alexander] *Problem* adds, after its paraphrase of §10, the conclusion that the contents of the head should not move with a single motion. §§11-12 seem to employ only the notion of a rotation which is desirable and should not be disturbed (see below on 12.97-100).

11.87-88 ποιεῖ δὲ καὶ ἄλλη τις ἐναντίωσις ... οἷον ἢ τῆς ἐνδείας καὶ τῆς πληρώσεως] The claim that both lack of food and excess cause the same symptoms is typically Peripatetic. One may compare the explanation of both heat and cold causing fainting in Theophrastus’ *On Fainting* (345 FHS&G), and, indeed, the observation that dizziness can be caused both by motion and by lack of it in §9 above. Not that the claim, here or there, conflicts with the facts; and some types of dizziness are caused by alterations in fluid pressure in the inner ear¹⁰⁷—though faintness can also be caused by *lack* of blood flow to the brain when blood has been diverted to the digestive system by a large meal. Colliquescence, unnatural liquefaction,¹⁰⁸ is mentioned as caused by lack of food in [Aristotle], *Problems* 1.5 and 8.9.¹⁰⁹ Flashar, commenting on the former passage, also compares *On Shortness of Life* 5 466b29;¹¹⁰ where it is stated that plants and animals that do not receive

¹⁰⁵ Cf. Schneider 1818-1821, vol.4 p. 771.

¹⁰⁶ See also above, n. 91.

¹⁰⁷ ‘The presumed pathophysiological basis of Menière’s disease is episodic lymphatic hypertension’, Halmagyi and Cremer 2000, p. 131; cf. references there, and Brandt 1999, pp. 83, 86-90, 104. I am grateful to Anthony Gordon for these references.

¹⁰⁸ Cf. Aristotle, *GA* 1.18 724b26; Peck 1942, p. lxvi.

¹⁰⁹ The Oxford translation has “wasting” for σύντηξις in the former passage, but “liquefaction” in the latter.

¹¹⁰ Flashar 1991, pp. 390-391. (But he wrongly gives the reference as to the *Meteorologica*.)

food συντήκει themselves. Colliquescence plays a major part also in the explanation of fatigue in Theophrastus' *On Fatigue*.¹¹¹

11.90-91 ἀμφοτέρα γὰρ ταῦτα καταβαρύνει καὶ διύστησι τὰς περιόδους] Wimmer's ἀμφοτέρα ... καταβαρύνει, "both these weigh upon", goes against ἀνιοῦσα ... καταβαίνει ("rising up, it descends") of the entire MSS tradition, Photius, and all previous editors. I have nevertheless followed Wimmer; for, apart from the fact that with the traditional reading ταῦτα can hardly stand and needs to be emended to παρ' αὐτὰ, as in Photius, αὐτὴ (Grangerius) or αὕτη (Furlanus), it is not clear to what "rising up, *it* descends", in the feminine singular, can refer. If the reference is to residue, one would expect also a reference to colliquescence, the role of which in causing dizziness is otherwise left unexplained; similarly, if the reference is to surfeit, one would also expect a reference to lack. Wimmer's ἀμφοτέρα is therefore clearly right. On the other hand, it is not clear that the presence of ἐπίστησι "stops" in [Alexander] should cause us to follow Usener and Wimmer in preferring it to διύστησι "separates" of the Theophrastus MSS tradition and Photius; true, a copyist of the Theophrastean text even before Photius made his paraphrase might well have written διύστησι for ἐπίστησι, given the frequency of διύστημι in earlier sections of this text, but by the same token separating or disrupting orderly rotations explains dizziness as much as stopping or checking them does—indeed the former may simply be a form of the latter.

11.91-93 καὶ αἱ μέθαι καὶ αἱ φαρμακεῖαι καὶ ὅσα ἄλλα τούτοις παραπλήσια διὰ τοῦτο ποιεῖ τοὺς ἰλίγγους] That is, in Theophrastus' view, because they produce fluid: so 12.96-97 suggests. In fact the reason for alcohol producing dizziness is that it lowers the specific gravity of the fluid in the semicircular canals in the ear.¹¹²

12.93-94 ὅθεν καὶ τὸ σημεῖόν τινες ἐπ' ἀμφοῖν κοινὸν λαμβάνουσιν] As the parallel texts indicate, "both" refers not to lack

¹¹¹ See Michael Sollenberger's discussion in the present volume, and Roselli 2002. Cf. also Aristotle, *On Sleep and Wakefulness* 456b34-35, a reference I owe to Richard King.

¹¹² The reduction and its consequent reversal explaining why the sense of rotation is initially in one direction and then, as the effects wear off, in the other. See Brandt 1999, pp. 285-287.

and excess, but to drink and drugs, mentioned at the end of §11. One is fully purged when the purgative drug itself has been eliminated. One is reminded of Majno's observation that the only reason that the favourite Greek purgative, hellebore, did not kill more patients was that it was so effective at getting itself eliminated along with everything else.¹¹³ The thought process which led a scribe, after references to drink and not being able to count the roof-beams, to write "alien merriment", ἰλαρότης, in place of "alien fluid", ὑγρότης, in 96 is transparent enough.

12.97-99 ἐφ' ὅσων ἄλλων συμβαίνει πνεύματος ἢ ὑγρότητος γίνεσθαι πλῆθος ἢ καὶ τῶν ὑπαρχόντων διάστασιν] This, as Stephen White points out to me, refers back to the three options canvassed in 1.2-5. The reference of "already present" is somewhat vague: it could, as Bill Fortenbaugh points out to me, be to breath and fluid, to the heavy and light parts (10.82) or to the pre-existing rotations (11.90-91; see above on 10.81-83). All these options except the first actually amount to the same thing, for what we are concerned with is indeed the separation of heavy and light parts in a rotating fluid. Supposing a reference to breath, however, would imply that breath is actually involved as a part of the normal cerebral rotation, which does not seem to be the case (see above, on 1.2-4).

13.102-103 ὅταν δὲ κινῶνται φανερόν γίνεται] At first sight the contrast in §13 is between fluid in the head being stable when you are seated and its moving when you stand up; the editors' σφαλερόν, "unstable", might thus seem appropriate in 103. (The tense of ἀνιστάμενοι clearly shows that the reference is to the process of standing up rather than to simply being in a standing position; I am grateful to Sylvia Berryman for emphasising this. Dizziness or faintness produced by the act of standing up is in fact due to a consequent drop in the pressure of the blood supply to the brain.)¹¹⁴ But both in the pseudo-Aristotle *Problems* proper and in the [Aristotle]/[Alexander] *Problemata inedita* the point is clearly that, since motion keeps the fluid uniform, in those who are seated and at rest it is already uneven in fact,¹¹⁵

¹¹³ Majno 1975, p. 189.

¹¹⁴ Brandt 1999, p. 23.

¹¹⁵ Why then does this not also happen when one is standing up but stationary? (I am grateful to A.R. Jonckheere for asking this question.) Indeed, standing still for a long time

but this only becomes *apparent* when they stand up. φανερόν of A and other MSS¹¹⁶ is therefore right—unless we are to suppose that Theophrastus actually wrote σφαλερόν and a corruption to φανερόν occurred so early that the *Problems* enlarged upon Theophrastus' account in an attempt to make sense of what was actually a corrupt text.¹¹⁷ The fact that the texts in both collections of *Problems* are here fuller indicates not that they, or their source, are primary and the Theophrastean essay derivative, but rather that the *Problems* have spelled out, correctly, the explanation that Theophrastus leaves implicit.¹¹⁸

can produce dizziness and fainting, as soldiers standing to attention on parade know only too well. Theophrastus simply ignores this.

¹¹⁶ φανερόν is the reading of V^aRVBzS, and was also conjectured, on the basis of the *Problems*, by Usener—not on this occasion followed by Wimmer—and by Forster 1933, p. 141. Tiph. read φανερόν but interpreted it as referring not to the fluid but to the following statement: *certum quod ... efficit*. σφαλερόν was introduced by Grangerius, followed by all subsequent editors.

¹¹⁷ Photius' "it separates", too, is perhaps more natural as a rendering of "it becomes apparent (φανερόν)" than of "it becomes unstable (σφαλερόν)". His ἐμπίπτον supports Usener's ἀποκλῖνον, adopted by Wimmer, against ἄγον of A and editions up to Heinsius.

¹¹⁸ That the *Problems* often give a fuller text than the MSS of Theophrastus led Richter 1885, pp. 9 and 20 to argue that our MSS of Theophrastus give only excerpts, and Forster to emend the text of Theophrastus to conform to the *Problems*. But in both cases the inference seems unwarranted. See Fortenbaugh in this volume.

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INDEX OF IMPORTANT WORDS OCCURRING IN *ON DIZZINESS*

(References are to sections and lines of the Greek text.)

- ἄγειν] bring (heavy and light parts of brain in different directions) 10.83
ἄθροος] all together (of fluid in head) 13.103
αἰτία] reason (why fluid things cannot easily rotate) 2.17; (for dizziness) 3.22;
3.29
αἴτιον] reason (why fluid things cannot easily rotate) 2.16; (for dizziness) 9.72
αἰώρα] swing (looking at produces dizziness) 7.59
ἄλλότριος] alien (breath) 1.2; (excess) 1.6; (fluid) 12.96
ἅμα] at the same time 9.78; together (of parts of brain) 10.82; 10.85
ἀναβλέπειν] look up 8.66
ἀνάγειν] refer to (as explanation) 3.24
ἀνάστασθαι] stand up 13.101
ἀντικρούειν] strike against (part of fluid) 1.13
ἄνω] upwards 10.85
ἀνωμάλως] unevenly (of movement in head) 7.61
ἀποβλέπειν] look at 8.64
ἀποδιδόναι] give explanation 10.81
ἀποκλίνειν] incline (of fluid in head) 13.103-104
ἀπορεῖν] be perplexed 3.24
ἀποτείνειν] stretch out (of sight) 8.67
ἀποτέμνειν] cut short (sight) 8.68
ἀπότομος] steep (things looked at) 8.63
ἀριθμεῖν] count 12.95
ἀρίστερος] to the left (of running anticlockwise) 3.27; 6.44; left-hand (parts of
a person) 6.47
ἀσθένεια] weakness (of left-hand part of a person) 6.47
ἄστρον] star (looking at makes sailors dizzy) 7.58
ἀτενισμός] fixed gazing 9.74
ἄτοπος] strange 9.72
εἰς τὸ αὐτό] at the same thing (looking) 9.69
ἐν τῷ αὐτῷ] in the same place (turning around) 4.30; (turning head) 5.37;
5.42; (arriving at, in circular path) 5.39

βαρύς] heavy (parts in brain) 9.73; 10.82; 10.84

βάσις] base (of cone) 4.36

βιάζεσθαι] force (one's way in, of excess in region of brain) 1.7

βλέπειν] look 6.53; 9.69

βραδύς] slow (of walking) 4.34

γωνία] angle 6.45

δεῖν] ought 10.82; 10.85

δεξιός] right-hand (parts of a person) 6.46

διαδιδόναι] transmit (movement) 6.51

διαδύεσθαι] penetrate 1.7

διάστασις] separation, separate 12.99

διαφέρειν] make a difference 1.9

διιστάναι] separate 9.74; 9.76; 9.80; 10.82; 11.90

δινεῖσθαι] be whirled, spun (of fluid things, raw eggs) 2.17, 2.19

δίνη] whirlpool 1.10; whirling (in brain) 10.82

δοκεῖν] seem 11.87

δοκός] roof-beam 12.95

δύνασθαι] can, be able, 2.16; 12.94

ἐγγύς] close (to centre of circle) 4.31; (to vertex of cone) 5.41

ἐγκαλύπτεσθαι] cover self up 7.58

ἐγκέφαλος] brain 1.5; 6.50; 9.76

ἐγκλίνειν] lean 4.34; 5.40

εἷς] single (of interior of boiled egg) 2.20

ἐκπίπτειν] be extended, be produced (geometrically) 4.35

ἐλάττων] smaller (of circle in which one walks, runs or turns) 3.25; 4.32; 5.38

ἐλαφρός] light (parts in brain) 10.85

ἐμβλέπειν] look at 7.57

ἐμβριθής] weighty (or sturdy?) 6.45

ἐμπίπτειν] intrude (of alien fluid) 12.96-97

ἐναντίος] opposite (causes for same effect) 9.72

ἐναντίωσις] opposition 11.87

ἐνδεια] lack (of nourishment) 11.88 (bis)

ἐντος] interior (of boiled egg) 2.21; inside (of a circle) 6.46; (of head) 6.51; 7.61; 8.66

ἔξω] outside 6.51

ἔξωθεν] external (of source of movement) 1.10

ἐπαπορεῖν] raise problem 9.70

ἐπατενίζειν] fix one's gaze 9.70

ἐπίστασις] steadfast gazing 9.73

ἔσχατος] circumference (of circular movement) 10.83

ἔσω] inwards, towards the centre (of a circle) 5.42; 6.44

ἔσωθεν] external (of source of movement) 1.10

ἔτερος] further (movement) 6.50

εὐθύς] straight, in straight lines 4.35

εὐλαβεῖσθαι] (take) precautions against 7.58

εὐλογος] reasonable 6.54

ἐφθός] boiled (egg) 2.19

ἡρεμεῖν] be at rest (of sight) 9.31; (of person) 13.102

θέειν] run 3.26; 3.27; 4.33; 4.34; 6.44; 6.47; 6.49

θεωρεῖν] look at 7.59

ἱλιγγιᾶν] become dizzy, dizziness 3.25; 4.31; 7.55; 7.57; 8.63; 13.101

ἱλιγος] dizziness 1; 1.2; 1.15; 4.30; 5.43; 6.52; 9.69; 9.77; 10.84; 11.91; 11.93; 13.104

ἰσορροπεῖν] be in equilibrium 1.14

ἶσος] equal (time) 5.39

ἰστάναι] bring to halt, come to rest 1.13 (bis); 9.75; 9.76

καθαίρειν] purge 12.95

καθ' ἑκάστα] particular (occurrences) 3.23

καθίζειν] sit down 13.101

καταβάλλειν] throw (people) to ground 1.15

καταβαρύνειν] create heaviness, weigh upon 9.77; 11.90

κάτω] downwards 10.85

κέντρον] centre 4.34

κεφάλῃ] head (disturbance of) 1.3; (movement of), 1.5; 1.9; 6.52; (turning of) 5.37; (position of, when running in a circle) 5.41; 5.43; (fluid in) 13.102 *and see* ὑγρός

κινεῖν] move 1.4; 1.9; 1.10; 6.53; 7.60-61 (bis); 8.66 (bis); 9.70-71; 9.74; 9.78; 13.103; stir (posset) 9.80

κίνησις] movement 1.12; 6.50; 6.52; 7.55; 7.58; 9.78

κοινός] common, same 12.94

κορυφή] vertex (of cone) 4.35; 5.42

κοῦφος] light (parts in brain) 10.82

κραδαίνειν] vibrate (sight) 8.65

κυκεών] posset 9.80

κύκλος] circle (movement of head in) 1.5; 1.9; 6.48; 6.52; (movement of fluid in head) 1.7; (walk, run in a) 3.24; 3.26; (turn in a) 4.32; 5.38; (in which someone runs, forms base of cone) 4.36; 6.45; (object moving in a); 6.53; (of movement of sight) 7.61; 9.71

κυκλοφορία] circular movement 9.73; 10.81

κῦμα] wave (of the sea) 7.57

κύπτειν] stoop down 10.84

κῶνος] cone 4.36; 5.38; 5.41

λαμβάνειν] take (indication) 12.94

μακράν] to a great length, a long way (of sight) 8.64; 8.67

μακρός] tall (tall people become more dizzy) 3.27; (tall people turn head more in same place) 5.40

μάλιστα] most (of becoming dizzy) 3.28; 4.31; 5.43

ᾤλλον] more, to a greater degree (of becoming dizzy) 3.25; 3.27; 4.32; 6.46; 6.48; 7.56; 13.101; (of turning head in same place) 5.38; 5.40; (of leaning) 6.44; (of forcing towards inside of circle) 6.46

μέγας] tall (of things looked at) 8.63

μέθη] alcoholic drink 11.91

μεθύειν] be drunk 12.96

μείζων] taller (person) 5.41

μέσος] centre (of circular movement) 10.83

μῆκος] height, vertical axis (of a person) 4.35

μόνος] alone (of running) 3.27; 6.48

μόριον] part (of head) 9.75; 13.103

νεύειν] lean 6.44

οἶνος] wine (residue from, causes giddiness) 1.4

ὅλος] all(?) 7.57

ὁμοίως] in the same way as 1.14

ὀξύς] acute (of cone) 5.38; (of angle) 6.45

ὄψις] sight 6.49; 6.53; 7.55; 7.60; 7.61; 8.65; 9.71; 9.75

πάθος] experience (of dizziness) 3.22; 6.54; 9.71; 12.100

πειράσθαι] try 3.24

περίοδος] rotation (in brain) 11.91

περιπατεῖν] walk, walk round 3.25; 4.33

περιττωματικός] from residue (of fluidity) 1.3

περίττωσις] residue 11.89

περιφορά] rotation 6.48
 πλεῖν] sail (at sea) 7.56
 πλέον] excess 1.6; in larger quantity (of fluid in head) 13.102
 πλεονάκις] more often (of arriving at same point in circular path) 5.39
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 πλήρης] full (of passages in body) 11.89
 πλήρωσις] satiety 11.88
 πλησμονή] satiety 11.89
 πνεῦμα] breath 1.2; 12.98
 ποιεῖν] make, produce 1.15; 6.45; 6.50; 6.52; 9.77; 10.83; 11.87; 11.89; 11.93;
 12.97; 13.104
 πολλοί] many people (of running with) 3.26; 6.47
 πόρος] passage (in body) 11.90
 προαιρέσει] deliberately (of movement of head) 1.9
 προσαποβιάζεσθαι] force towards 6.46
 προσβάλλειν] apply self (of sight) 6.49
 προτερεῖν] be in advance 1.12

 ῥαδίως] easily (fluid things cannot easily rotate) 2.16
 ῥεῖν] flow 1.14

σείειν] shake (sight) 8.65 (bis)
 σημείον] indication 12.93
 σκοτοῦσθαι] suffer blurred vision 7.60
 στάσις] being at rest 9.75
 στρέφειν] turn, turn around, spin 2.16; 4.30; 4.32; 5.37
 στρωτήρ] rafter 12.95
 συμβαίνειν] happen, come about 1.8; 2.18; 3.23; 5.37; 5.42; 7.55; 7.60; 8.64;
 8.67; 9.71; 12.97; 12.99
 συμμένειν] stay together 9.78-79
 συμπεριφέρειν] rotate (one's sight) 7.59-60
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 boiled egg) 2.21; (sight, looking); 6.49; 6.53; 9.69; (parts of brain) 9.76
 συνίστασθαι] gather together (of fluid in head) 13.102
 σύντηξις] colliquescence 11.88
 σφάλλειν] overturn 2.20
 σφοδρότερον] more intensely (of becoming dizzy) 3.26
 σώζειν] preserve 9.74

ταραττειν] cause disturbance, disturb (inside parts of head) 7.62; 8.66
 ταραχή] disturbance (in brain) 6.50; 12.97

ταχύς] fast (of running, turning) 3.26; 4.32; 4.33; 5.39; quick (of development of dizziness or giddiness) 4.31; 6.48; 6.54; 7.56; 7.60

τόπος] region (around brain) 1.5

τροφή] nourishment (residue from) 1.3

τροχός] wheel (looking at produces dizziness) 7.59

ύγρός] fluid 2.16; (region around brain) 1.6; 1.8; 1.11; (in head) 13.102

ύγρότης] fluidity (from residue) 1.3; (of raw eggs) 2.19; (alien fluid produces dizziness) 12.96; (abundance of fluid) 12.98

ὑπάρχειν] be present 12.99

ὑστερεῖν] be behind 1.12

ὑφίστασθαι] settle (of part of fluid) 1.13; 2.20

ὑψηλός] high (things looked at) 8.63

φανερός] clear 7.56; apparent (of fluid in head) 13.103

φαρμακεία] administering of drug 11.92

φέρεσθαι] be carried 1.14

φλέψ] vessel (in body) 1.7

φορά] movement (of fluid in head) 1.11

φύσις] nature (of region around brain) 1.6; πεφυκέναι, be naturally constituted 9.78

φῶς] light (cuts sight short) 8.68

χρόνος] time (between successive arrivals at same point in circular path) 5.40

χυλός] juice (residue from) 1.4

χωρίζειν] set apart 9.77; 10.84

ῥθεῖν] drive 1.7

ῥμός] raw (eggs) 2.18

ῥον] egg (not easily rotated if raw) 2.18

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(References are to sections and lines of the Greek text.)

Ἡράκλειτος] Heraclitus 9.79

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Theophrastus, *On Fatigue*

Michael Sollenberger

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PREFACE

As a Mellon Fellow teaching the history of medicine and the history of science at Washington University in St. Louis, I began work on this edition of *On Fatigue*. I was fortunate enough to be able to visit the Vatican Film Library at St. Louis University and work through the microfilms of the manuscripts containing the work. By the end of the year I had collated seven of the eleven existing manuscripts containing the *opusculum*.

Many different people have come to my aid in my efforts with Theophrastus' *On Fatigue*. Several different preliminary drafts of a text, translation, and commentary were presented at different times and places. In August of 1989, Project Theophrastus held its biennial conference in Theophrastus' birthplace of Eresos, Lesbos, at which my work was first presented. I received much helpful criticism from the respondent to that paper, Tony Preus, and helpful suggestions from Richard Sorabji, George Kerferd, and Ian Kidd. Then, William Fortenbaugh invited me to present another draft at Rutgers University in February 1994. In June of 1996, André Laks invited scholars to Lille University to participate in roundtable discussions of Theophrastus' *opuscula*, including *On Fatigue*. I was lucky enough to receive profitable comments there from André, Glenn Most, and John Vallance. In July of 1999 Georg Wöhrle convened an international group of scholars at the University of Trier to discuss Theophrastus' *opuscula*; one session was devoted to *On Fatigue*. Amneris Roselli and Peter van der Eijk presented papers on Theophrastus' work from which I gained valuable information as well as from private conversations with both of them. David Mirhady read through my text, translation, and comments in Trier and provided me with countless improvements. Through all these years of work on Theophrastus' *On Fatigue* I have been especially fortunate to have had the support, corrections, suggestions, and frequent proddings from William Fortenbaugh and Robert Sharples to whom I wish to express my sincere thanks. Most of all, I have been truly blessed to have always had my dear wife, Merrill, with me for more than twenty-five years. Her continued encouragement, boundless patience and enduring love have remained a wonderful source of inspiration and stimulus. To her I dedicate this work with love.

INTRODUCTION

According to Diogenes Laertius, Theophrastus was the author of at least thirteen bio-medical treatises, each one book in length.¹ It is probable that Theophrastus also dealt with medical and physiological matters in other works listed by Diogenes.² Only three of these monographs—or *opuscula*—survive in manuscripts.³ There are scattered references to two others in later authors⁴ and we also have excerpts from five of these writings made by the patriarch Photius during the 9th century. Besides the works of many other authors which he has preserved for us in truncated form, there are excerpted portions from Theophrastus' *On Sweat*, *On Dizziness*, *On Fatigue*, *On Fainting*, and *On Paralysis*. These brief works of Theophrastus have attracted very little attention in the past 500 years. Until now, the three *opuscula* have not been edited in well over a century, not since Wimmer included them in his edition-translation of Theophrastus' works in 1866. William Fortenbaugh has re-edited and translated *On Sweat*, Robert Sharples has done the same with *On Dizziness*; I have worked on *On Fatigue*. The only extensive studies of *On Fatigue* are the dated translation and commentary by the Cretan physician Daniel Furlanus published in 1605⁵ and those of Johannes Schneider, in his

¹ *On Secretion* (D.L. 5.46), *On Epilepsy* (5.45), *On Sweat* (5.44), *On Dizziness* (5.44), *On Fainting* (5.44), *On Fatigue* (5.44), *On Plagues* (5.44), *On Melancholy* (5.44), *On Paralysis* (5.45), *On Derangement* (5.45), *On Respiration* (5.45), *On Choking* (5.45), and *On Hair* (5.45).

² Perhaps to be included are *On Old Age* (5.43), *On Drunkenness* (5.44), *On Affections* (5.45), *On Sleep and Dreams* (5.53), *On Vision*, in four books (5.49), and the various collections, e.g., *Collection of Problems*, in five books (5.53); listed again in only one book (5.48).

³ There are twelve known manuscripts which contain the *On Sweat* and *On Dizziness*; eleven of these also have *On Fatigue*. On these manuscripts and their stemmatic relationships see W. Burnikel, *Textgeschichtliche Untersuchungen zu neun Opuscula Theophrasts* (Wiesbaden: Steiner, 1974), esp. p. XXVIII–XXXIX.

⁴ E.g., *On Epilepsy* is referred to as *De caducis* by Apuleius, *Apol.* 51, *On Choking* by Athenæus, *Deipnos.* 2.73 66 F, and also by Oribasius, *Synopsis to Eustathius* 8.59 (CMG vol. 6.3 p. 270.1 Raeder), who refers to it as Περὶ τῶν ἀπαγχονμένων.

⁵ Furlanus himself was a noted medical practitioner and thus qualified to write a commentary on Theophrastus' text. See C. B. Schmitt, "Theophrastus," *Catalogus Translationum et Commentariorum: Mediæval and Renaissance Latin Translations and Commentaries. Annotated Lists and Guides*, vol. 2, ed. P. Kristeller and F. Cranz (Washington, D.C.: Catholic University Press, 1971), 263 and 295–6.

five-volume edition-translation-commentary of Theophrastus' *opera omnia* in 1818 and 1821.

Manuscripts

Given William Fortenbaugh's thorough discussion of the manuscript tradition in his introduction to his edition of *On Sweat*, it seems unnecessary to enter into great detail here. I have followed his lead in the assessment and citation of manuscripts.

The oldest manuscript containing *On Fatigue*, codex Vaticanus Græcus 1302 (designated by the siglum A), dates from the 13th century. According to Burnikel and others who have investigated the manuscript tradition, all later manuscripts used A as their source.⁶ Nevertheless, A is by no means infallible; variant readings in other manuscripts have been considered, too, even though they can be regarded at best as conjectures and emendations or, in some instances, lucky mistakes. In view of this I investigated microfilms of five other manuscripts: codex Bernensis Græcus 402 (B; circa a.D. 1480) codex Vaticanus Graecus 1305 (V; a.D. 1469–1477), codex Vaticanus Urbinas Graecus 108 (V^a; ante a.D. 1427), codex Vaticanus Palatinus Græcus 162 (R; a.D. 1442–1457), and codex Parisinus Græcus 2277 (z; a.D. 1479). For readings found in other manuscripts I have relied on Burnikel's reports scattered throughout his monograph; as a result, the readings which I give from manuscripts besides A are not exhaustive but entirely selective; where they confirm the reading of A they are not cited. Moreover, I have not chosen not to report differences in accents, breathings, iota-subscripts, word divisions, punctuations or clear misspellings, unless they are actual word-forms and could make sense in the context.

The Aldine edition (the *editio princeps*) is considered to have almost equal authority with the manuscripts, although it is clearly not independent of them. It is probably not the case that the immediate source of the Aldine was A. Burnikel demonstrated that it has clear relations with three manuscripts (B, H, and S) and even suggested that the Aldine edition used B after the second corrector had done his work as its primary source.⁷ Moreover, the Aldine served as the basis for later editors, providing them with a

⁶ Burnikel, 75–6, 84–91 (stemma on p. 90); see also U. Eigler and G. Wöhrle, eds., *Theophrast, De odoribus*. Beiträge zu Altertumskunde 37 (Stuttgart: Teubner, 1993), 8–9 and A. Laks and G. Most, eds., *Théophraste, Métaphysique* (Paris: Les Belles Lettres, 1993) LXVII–LXVIII. The sigla used in this edition of *On Fatigue* are those of Laks and Most, XLII–LXV.

⁷ Burnikel pp. 22–5 and 30 (stemma).

“control text”; thus its significance is enhanced by its primacy among printed editions in the case of all the *opuscula*.

The Pseudo-Aristotelian Problems

One of the more striking things about Theophrastus' work is that it seems to have been a chief source, but not the only source, for the fifth book of the pseudo-Aristotelian *Problems*, entitled “Ὅσα ἀπὸ κόπου,” “Everything about Fatigue” (880b15–885b16). Scholars generally agree on this, e.g., Forster (1921) 166–7 and Flashar 335–7. This book, just as the majority of the books of the *Problems*, has been dated to the second half of the third century B.C.⁸ Thus on chronological grounds the *Problems* can very easily have been influenced by the work of Theophrastus. Such influence shows itself primarily in Book Five of the *Problems*, most dramatically by the close parallels to §§ 9–17 of Theophrastus' work. In many cases the *Problems* amplifies, clarifies, or in some way supplements the remarks made by Theophrastus. These do not only assist our understanding of the comments of Theophrastus, but also offer a source from which we can, with reservations, emend, correct, and even restore the text of Theophrastus' work. And, conversely, it is possible to improve the text of the *Problems* in some instances from Theophrastus' work.⁹

The Photian Excerpts

As mentioned earlier, in his *Library* the patriarch Photius included material which he found in five of Theophrastus' *opuscula*: he presents excerpts from Περὶ κόπων at cod. 278 527a24–b10 (CB vol. 8 p. 163.3–164.2 Henry). Actually, Photius gives us material from only parts of the second half of the treatise, i.e., from §§ 11, 12, 13, 15, 16, and 18, and these are not always verbatim but are often adapted in some ways, added to in others, and many connecting ideas are frequently omitted. Although Burnikel states that Photius made his excerpts from a better text than we have (which means it was a codex not dependent on A),¹⁰ Photius provides us with very little material with which we can improve the text of *On Fatigue*. Nevertheless, given Burnikel's insistence on the quality of Photius' source,

⁸ See H. Flashar 316–18 and K. Abel's review of Flashar's book in *Gnomon* 38 (1966) 229ff.

⁹ See further E. S. Forster (1929) 165 and (1933) 140.

¹⁰ Burnikel, 131–2.

we cannot simply jettison Photius' excerpts, but perhaps use them cautiously to make corrections, however small, to the text of Theophrastus.¹¹

Apparatuses

Like Professors Fortenbaugh and Sharples, I have used three different apparatuses in the construction of this edition of *On Fatigue*. 1: an upper apparatus for reporting the text of Photius' excerpts from Theophrastus' work which I have translated into English on the facing translation page; 2: a middle apparatus for recording parallel texts from other authors, e.g., ps.-Arist., *Problems*, Galen, *Hygiene*, etc.; and 3: a lower, critical apparatus for recording variant readings found in the manuscripts and scholarly corrections, emendations, and conjectures.

I have tried to streamline references to the corrections, emendations, and conjectures of scholars. References to Furlanus, Schneider, and Wimmer are of two kinds: when their Greek texts are referred to, I have simply printed the name of the editor (in the case of Wimmer, who made two editions, I indicate which edition is referred to by using suprascript 1 and 2 for the first and second editions respectively); when their translations or notes are referred to, I have given their name followed by the page number where it may be found. In the case of Schneider, since his notes and comments are to be found in different volumes, I have given the volume number as well as the page number.

Content and Structure of On Fatigue

Theophrastus begins with a review of various theories concerning the seat or seats and the cause or causes of fatigue (§§1–3),¹² moves to a discussion and delimitation of similar and related symptoms and manifestations of fatigue (§4), and ultimately, but somewhat tentatively, settles on a plurality of causes (§5). Types of treatments are then sketched out in a very general way (§§6–8), followed by a presentation of individual questions or particular problems involved in fatigue: the different fatiguing effects experienced by people in walking, running, sitting, or lying on even and uneven surfaces (§9), the specific effects felt in the individual body

¹¹ Burnikel, 132–42, discusses Photius' manner of excerpting and gives examples of how Theophrastus' text may be improved from the excerpts.

¹² Schneider divided the treatise into 18 sections, each approximately the same in length.

parts, e.g., that the thighs are more susceptible to fatigue than the calves (§10), that in climbing one feels more stress and thus fatigue in the calves but in descending in the thighs (§§11–12). Next Theophrastus remarks that it is more fatiguing to throw with an empty hand than when one holds a stone or some weight (§13), and then returns to the theme of fatigue from walking, commenting on the different effects of long and short walks on even and uneven ground (§§14–15). Changing to another topic, seminal discharge of fatigued persons during sleep, he attempts to establish some relationships between sleep, fatigue, and involuntary emissions of semen (§16). Returning again to therapies for fatigue, Theophrastus stresses that they should be in accordance with the age and physical constitution of the patient (§17). In the last section, incompletely transmitted in manuscripts, since the end is badly mutilated,¹³ Theophrastus asserts that moist bodies are more inclined to suffer fatigue than bodies with dry constitutions (§18).

Generally, then, the discussion starts from seats and causes of fatigue and moves to various symptoms and their therapies. Individual instances of fatiguing exertions follow, after which Theophrastus returns to therapeutic measures, winding up with remarks on constitutional dispositions toward fatigue. The treatise appears somewhat disorderly and unmethodical; one looks in vain for some plan of classification, however elementary, not to speak of a taxonomy of fatigue. But perhaps these are consequences of the form in which Theophrastus has cast his remarks. It may be that the work was not intended as a definitive handbook on the subject, exhaustively cataloguing and categorizing the various types, causes, symptoms, etc.

Unlike many of the writings in the Hippocratic corpus which include case studies (e.g., *Epidemics*) or the detailed investigations and prescriptions found in Galen's works, Theophrastus deals with topics in a question and answer mode, very much like we see in the pseudo-Aristotelian *Problems*. Topics are regularly introduced as questions with formulaic expressions such as διὰ τί, ἐν τίνι, πῶς, sometimes indirectly with διότι, πότερον . . . ἢ for double or multiple questions, etc., to which different answers are then given. Likewise, the answers are often worded in formulaic phrases such as ὅτι, ἢ ὅτι, ἢ διὰ, εἰ ὅτι sometimes as contradictions with ἀλλά or a μὲν . . . δέ construction, sometimes as paradoxes in the form of εἰ μὲν . . . ἄτοπον δέ, and so forth. One effect of such a form, as likewise in the *Prob-*

¹³ Thus Furlanus, 274, comments: *libellus est adeo lacer et mutilus, ut vix aliquæ ex illo habeantur integræ sententiæ.*

lems, is that of classroom exercises or discussions conducted in question-and-answer fashion, with various hypotheses being subjected to scrutiny from various angles for their tenability or congruity with factual evidence. The entire work, however, does not consist of this form, but for the many parts which do, what we have may be a record of school activities: the teacher asks a question and the students respond with various possible answers which are then criticized. This leads to an attempt to draw the correct solution from among choices offered, or, if there is none, to move to the presentation of yet another view. Now in the case of the *Problems* this distinctive form marks it as a record of classroom discussions which has developed into a notebook or folder for classroom use, a sort of syllabus for discussion of the topic of fatigue, to which additions and deletions were made over time as necessary; such gradual compilation by different hands at different times probably helps to explain some of the unevenness, disorderliness, contradictions, and repetitions which we meet in the work.¹⁴ But this does not appear to be the case with Theophrastus' *On Fatigue*. Rather I want to suggest here that Theophrastus' work, or at least large portions of it, contains his own notes and is the original classroom discussion of fatigue which was continually and repeatedly reworked, added to and deleted from, and found final form in the fifth book of the Aristotelian *Problems*. Proof of this hypothesis is, of course, no simple task. Nevertheless, faced with the passages in Theophrastus' work which find clear parallels in the *Problems* together with the several verbatim reproductions of passages from the earlier work into the later one, one cannot help but wonder what the original form of the *Problems* was and also whether Theophrastus' work may not be the original, or an early stage of the *Problems*.¹⁵

The Ancient and Modern Theories of Fatigue

Physical fatigue has been experienced by all people from time immemorial, but two groups of individuals have been especially susceptible or party to it: namely, athletes together with their trainers, and physicians. Clearly these people will have learned to recognize the various symptoms and causes of fatigue quickly and sought not only to treat them but also to

¹⁴ See E. Forster, "The Pseudo-Aristotelian Problems: Their Nature and Composition," *CQ* 22 (1929) 163ff., and Flashar, 316–26 and 341–6.

¹⁵ See Flashar, 309–16 and 321–2.

forestall the effects of overexertion and exercise by means of different precautions. The first discussions of fatigue, its symptoms and causes and recommendations for treatment, are found in the Hippocratic corpus of writings. Numerous remarks on the topic can be found throughout the corpus, but there is only one extended treatment which appears in *On Regimen* (2.66). This work was probably written during the second half of the fourth century B.C.¹⁶ The section on fatigue concerns exclusively its symptoms, causes, and treatment in three groups of people who have 1) overexerted themselves in exercise although not in training, 2) have trained using exercises to which they are not accustomed, and 3) have overexerted themselves in a customary exercise while training. While fatigue was most likely discussed in other medical literature before and during the fourth century B.C., nothing of any major significance has survived.¹⁷ Perhaps the next treatment of fatigue is the more comprehensive work of Theophrastus under discussion, Περὶ κόπων. Pinning down the date of composition of ancient writings can often be very difficult, and this work is no exception. There are no internal indications which can help us in determining the date of composition or even a time after which or before which the treatise could have been written; it can only be suggested that it may have been written during the last part of the fourth century B.C. or the first few years of the third century.¹⁸ Except for the sections of the pseudo-Aristotelian *Problems* mentioned earlier, fatigue receives only scant mention in the extant medical literature of the following centuries,¹⁹ and it is not until the time of Galen, the second century A.D., that we find another extended discussion of it. In his *Hygiene* (*De sanitate tuenda*) there is a long and

¹⁶ See Flashar, 470.

¹⁷ Most physicians of this period are no more than names. But Diocles of Carystus, probably a contemporary of Aristotle and supposedly a Peripatetic, has some interesting information concerning fatigue. Fragments of his works are collected in M. Wellmann, *Die Fragmente der sikelischen Ärzte*, vol. 1 (Berlin, 1901), esp. fr. 141 and 147. Peter van der Eijk (Newcastle) has recently published a new edition of the fragments of Diocles.

¹⁸ If Περὶ κόπων was a teaching text, then perhaps it will only have been used in school. Aristotle set up the Peripatos in Athens in 335 B.C., and Theophrastus took over when Aristotle fled Athens and died in 322 B.C. Theophrastus was in charge of the school until his death in 287/6 B.C. There is no definite information contained in this work which allows the assignment of a specific date, or even a *terminus post* or *ante quem* for its writing.

¹⁹ Celsus (fl. first quarter of 1st century A.D.) has a few remarks on fatigue in his *On Medicine* 1.2–3, as does Soranus (fl. early 2nd century A.D.) in his *Gynecology* (e.g., 2.30 [CMG vol. 4 p. 76] and 3.17 [p. 105]). Much searching remains to be done in all periods. Unfortunately, there is in general a noticeable lack of modern editions of ancient medical texts.

very detailed exposition of the seven types, causes, symptoms, and various therapies for fatigue.²⁰ What is especially interesting is that Galen knew about Theophrastus' work, for he begins his chapter on fatigue with the following words:

"First, then, it is likely and very frequent for a gymnastic young man to fall into an error such as fatigue. Concerning this many people, not only physicians and gymnastic trainers, but also philosophers have often spoken, just as Theophrastus, by whom a whole book was written about it."²¹

Of course Galen's works attained authoritative status and eclipsed the attempts and findings of many other earlier authors and on countless medical topics, including fatigue, his views remained dominant for well over a thousand years.²² Given the supremacy of Galen in the world of medicine, it is not surprising that Theophrastus' work in medicine and the discussions of medical and physiological topics in the Aristotelian *Problems* were hardly read and little known during the ensuing centuries. Yet it is interesting and instructive to read these works side by side and to see in Galen the systematic development of some of the observations and conclusions of Theophrastus and the fifth book of *Problems*.

Ancient physicians believed that fatigue was caused by σύντηξις, the product of the melting or liquefaction of bodily wastes due to motion of the parts of the body in exercise, overexertion, etc. The fluids thus formed are not secreted or excreted like other bodily wastes (περιττώματα) but permeate the body and settle in various places, e.g. the joints, especially those which are sinewy. One of the symptoms of this, Theophrastus remarks, is a feeling of being weighed down (1.10). Since the σύντηξις-theory is essentially a 'hydraulic' theory of fatigue, it leads naturally to a hydraulic therapy—get rid of the excess fluid in the limbs and the fatigue will disappear.

Ancient physicians and writers on medical topics, including Theophrastus, however, did not understand muscles and their functions

²⁰ Galen, *Hygiene* 3.5.1–4.11.19 (CMG vol. 5.4.2 p. 83.39–134.24 Koch). The types are ulcerous (έλκώδης), tensive (τονώδης), inflammatory (φλεγμονώδης) and four "mixed" types, combinations of the three simple ones.

²¹ *Hygiene* 3.5.2 (p. 84.5–9).

²² It is obvious that many authors repeat Galen very closely on the topic, e.g., Aretæus, *On Causes and Signs of Acute Diseases* 4.13.18 (CMG vol. 2 p. 89.23ff. Hude) and 7.2.17 (p. 148.25ff.), Ætius Amidenus (ca. fourth century), *Medical Books* 4.33–9 (CMG vol. 8.1 p. 378.15–379.19 Olivieri), and Oribasius, *Coll. medic.* 6.11.1–6.19.3 (CMG vol. 6.1.1 p. 164.15–174.33 Raeder) and *Synopsis to Eustathius* 5.15 (CMG vol. 6.3 p. 158.21–159.18 Raeder), and in other places.

correctly. They did not seem to recognize that movements are brought about by the contractions of muscles, and that the energy needed for those contractions is acquired by oxidation of metabolic wastes, namely hydrocarbons, mainly sugars, present in the muscles. There are two ways of exercising muscles: *aërobic* and *anærobic*. In *aërobic* exercise there is enough oxygen present in the muscles so that sugars are completely broken down into carbon dioxide and water, and blood flow is sufficient to carry off the carbon dioxide as it brings the oxygen. But if muscles work with insufficient oxygen, as in *anærobic* exercise, the sugars do not break down completely but only as far as lactic acid and other similar hydrocarbons; that in turn ‘poisons’ the muscle, reducing its function and causing discomfort and even pain. Although Galen’s therapeutic comments do indicate an empirical understanding of a difference between strenuous and non-strenuous exercise in their relationship to fatigue, he does not have a theoretical grounding for explaining that difference, yet that is exactly what the modern theory provides.

Fatigue from excess lactic acid is indeed experienced as a ‘heaviness’ in the limbs as Theophrastus mentions (3.23). For us, the experience of heaviness is caused by the reduced efficiency of the muscles; for Theophrastus and other subscribers to the syntexis-theory, it was caused by an actual increase in the weight of the limbs, mechanically most easily understood by attributing (not observing) an accumulation of fluid in the affected parts.²³

²³ I owe a debt of gratitude to Tony Preus for his help in explaining the modern understanding of fatigue.

SIGLA

codex ex quo alii pendent

A = Vaticanus Græcus 1302 (no. 16 Burnikel), s. xiv ineuntis

codices alii

B = Bernensis Græcus 402 (no. 19 Burnikel), circa a.D. 1480

D = Mediolanensis Ambrosianus P. 80 sup. (no. 14 Burnikel), ante a.D. 1427

H = Leidensis Vossianus Græcus Q 25 (no. 18 Burnikel), a.D. 1487

M = Venetus Marcianus Græcus Z 260 (no. 12 Burnikel), a.D. 1442–1457

N = Neapolitanus III D 1 (no. 25 Burnikel), a.D. 1497

R = Vaticanus Palatinus Græcus 162 (no. 13 Burnikel), a.D. 1442–1457

S = Londinensis B.M. add. 5113 (no. 15 Burnikel), a.D. 1480–1487

V = Vaticanus Græcus 1305 (no. 30 Burnikel), a.D. 1469–1477

V^a = Vaticanus Urbinas Græcus 108 (no. 17 Burnikel), ante a.D. 1427

z = Parisinus Græcus 2277 (no. 23 Burnikel), a.D. 1479

editio princeps

Ald. = Editio Aldina (no. 22 Burnikel), a.D. 1497

aliæ editiones et adnotationes ad textum

Burn. = W. Burnikel, *Textgeschichtliche Untersuchungen zu neun Opuscula Theophrasti*. Wiesbaden: Steiner, 1974.

Forst.¹ = E. Forster, "Some Emendations in the Fragments of Theophrastus," *The Classical Quarterly* 15 (1927) 166–8.

Forst.² = E. Forster, "Further Emendations in Theophrastus," *The Classical Quarterly* 27 (1933) 140–1.

Furl. = D. Furlanus, *Editio et translatio cum commentariis operum omnium Theophrasti*. Hanoviæ: C. Marnius, 1605.

Regenbogen = O. Regenbogen, "Theophrastos," no. 3. *Pauly's Realencyclopädie der classischen Altertumswissenschaft*. Suppl. Vol. 7. Stuttgart: Druckenmüller, 1940. Col. 1354–1562.

Schn. = J.G. Schneider, *Theophrasti Eresii quæ supersunt omnia et excerpta librorum*. t. 1–4 Leipzig: Teubner, 1818; t. 5 Leipzig: Teubner, 1821.

Wimm.¹ = F. Wimmer, *Theophrasti Eresii opera quæ supersunt omnia*. t. 3 Leipzig: Teubner, 1862.

Wimm.² = F. Wimmer, *Theophrasti Eresii opera, quæ supersunt, omnia Græca*. Paris: Didot, 1866.

Θεοφράστου Περὶ κόπων

- 1 ἐν τίνι ποθ' ὁ κόπος (ἢ) τίσιν ὡς πρώτοις, πότερον ὡς Ἐπιγένης
 ὑπέλαβεν ἐν φλεβὶ καὶ νεύρῳ, ἢ μόνον ἐν νεύρῳ; τούτου γὰρ καὶ
 ἡ κίνησις· ἢ ὑπερβολὴ συντήξεως διὰ κίνησιν; ἢ ἀπλῶς οὐπερ
 πόνος, ταύτη καὶ ὁ κόπος, διὸ καὶ αἰεὶ βαρύνεται ὁ κοπιῶν; εἰ οὖν 5
 τὸ νεῦρον μὴ δεκτικὸν ὑγρότητος, οὐκ ἂν ἐνταῦθα ὁ κόπος ἐνείη
 κατὰ φύσιν· εἰ δὲ ὁ κόπος ἐξαλλαγή τις, ἄτοπον εἰ μὴ δι' ὧν ἡ
 κίνησις καὶ ὁ πόνος, ἐν τούτοις καὶ ὁ κόπος, ἀλλ' ἐκ τῆς
 κινήσεως ἐπιρροῇ τῆς συντήξεως εἰς αὐτὰ ταῦτα καὶ τὰς
 2 καμπάς, ἅπερ μάλιστα βαρύνονται καὶ κοπιῶσι. λέγουσι δὲ καὶ 10
 τὰς σάρκας καὶ ὅλον τὸ σῶμα κοπιᾶν, ὅθεν καὶ τοὺς
 ὀστεοκόπους ὀστάγρας καλοῦσιν. εἰ δ' ἐν ὀστοῖς ὁ κόπος,
 πότερον ὡς κινουσιν ἢ κινουμένοις ἢ ὡς ἐπιρροὴν δεχομένοις; ἢ
 οὐδὲν κωλύει τρόπον τινὰ ἀμφοτέρως, καὶ γὰρ κινούμενά πως
 καὶ δεχόμενα τὴν ἐπιρροήν; ὅταν γὰρ εἰς τὸ ἐντὸς διίκηται διὰ 15
 πλῆθος τοῦ πόνου, τοῦτ' ἐν τοῖς ὀστοῖς κόπος· ἐπεὶ καὶ ἐν τῇ
 σαρκὶ καὶ ἐν ὅλοις τοῖς σώμασιν, ὃ δὴ καλοῦσι συγκεκόφθαι· ὃ
 διαδοθέντος συμβαίνει τοῦ πόνου πρὸς ἅπαντα τὰ μέρη καὶ
 μάλισθ' οἷς ἂν τις ἐνεργῇ καθάπερ τοῖς ἄνω καὶ κάτω, καὶ
 αὐτῶν τούτων μορίοις τισὶν ὥσπερ καὶ ἐν ταῖς σκληροκοιτίαις. 20
 3 ὡς δ' ἀπλῶς εἰπεῖν, ἐν τοῖς καμπτομένοις μέρεσι μάλιστα καὶ
 νευρωδεστάτοις ὅταν τις σύντηξις ἐπὶ τὰ νεῦρα καὶ τὰς καμπάς
 ἔλθῃ· καὶ ἡ βαρύτης ἀπὸ ταύτης. διὸ καὶ οὐδεὶς πώποτε τὴν

1 *Diogenes Laertius, Vitae philosophorum* 5.44 = 1.124 et 328 no. 10 *FHS&G et Photius, Bibliotheca* 527a24 (CB 1.8 p.163.3 Henry); cf. *Galenus librum De sanitate tuenda* 3.5.2 (CMG 1.5.4.2 p.84.8-9 Koch) *quo loco verba haec inveniuntur*: καὶ Θεοφράστῳ βιβλίον ὅλον ὑπὲρ αὐτοῦ (sc. κόπου) γέγραπται 4 cf. *Arist., De somno et vigilia* 3 456b34–6 et [*Hippocratis*] *De diaeta* 2.66 (1.6 p.582.17–584.3 Littré) 11–12 cf. *Galenus librum De san. tu.* 3.5.19–21 (CMG 1.5.4.2 p.85.28–86.5 Koch) et *Aetii Amideni libros medicinales* 4.38 (CMG 1.8.1 p.380.17–26 Olivieri)

1 κόπων *A Phot. Diog. Laert. (a W)*: κόπου *V Diog. Laert. (V)* 2 ἢ *add. Furl.* πρώτοις, πότερον *Schn.* 4.756: πρώτῳ, πότερον *Wimm.*^{1,2}: πρῶτον, πότερον *Furl.*: πρώτου, πότερον *Furl.* 274: προτυπώτερον *A*: πρωτοτυπώτερον *H* Ἐπιγένης *Furl.*: Ἐπίγονος *A*: ἐπίγονε *B R S V z*: ἐπιτέγονον *V^a*: ἐπίγον *Ald.* 3 ὑπέλαβεν ἐν *Schn.*: ὑπέλαβε ἐν *Furl.*: ὑπέλαβε *A* τούτου *Schn.*: τοῦτο *A* 4 ὑπερβολὴ *A*: ὑπερβολῇ *Wimm.*^{1,2} διὰ κίνησιν *Schn.*: διὰ κίνη *A*: διακίνη *B S Ald.*: διακίνης *H*: διακινεῖ *Furl.*: διατῆκει *Furl.* 274: διακινῆσθαι *V* 4–5 ἢ ἀπλῶς οὐπερ πόνος, ταύτη καὶ ὁ κόπος *Wimm.*^{1,2}: καὶ ἀπλῶς πόνον· οὐπερ

Theophrastus, *On Fatigue*

- 1 In what part <or> parts does fatigue primarily occur? Is it, as Epigenes supposed, in the blood vessel and sinew, or only in sinew? For indeed it is of this part (i.e., sinew) that there is movement. Or is there an excess of colliquescence on account of movement? Or is it simply that wherever there is stress, here, too, there is fatigue, on which account indeed the fatigued person is always weighed down? If, then, sinew is not suited to receive moisture, then there would not be fatigue in it by nature. But if fatigue is some alteration, it would be strange if fatigue were not also in those parts through which movement and stress occur, but resulted from movement by an influx of colliquescence into these very parts and the joints, with respect to which people are especially weighed down and fatigued.
- 2 And people also say that they become fatigued in the flesh and the whole body, so that they also call bone-weariness “bone-gout.” But if fatigue is in bones, is it as they move, either being moved, or receiving an influx (of colliquescence)? Or does nothing prevent somehow that it happens in both ways, for (bones are) both moved in some way and receive the influx? For whenever it penetrates within on account of the magnitude of stress, this is fatigue in the bones; and when it (occurs) in the flesh and in entire bodies, they indeed call this “being thoroughly worn out.” And this happens when the stress has been spread out to all the parts of the body and especially those with which one engages in activity, like the upper and lower (limbs), and in certain parts of these very parts, just as also happens in the use of hard beds.
- 3 To speak simply, (fatigue occurs) in the jointed parts especially and the most sinewy ones, whenever some colliquescence comes to the sinews and the joints. And the heaviness results from this. On this account,

αὐτὴ καὶ ὁ κόπος A : καὶ ἀπλῶς οὐπὲρ πόνος, αὐτοῦ καὶ ὁ κόπος *Furl.* : καὶ ἀπλῶς ὁ πόνος τοῦ αὐτοῦ, οὐπὲρ ὁ κόπος *Schn.* 5.lvi et 173 6 ἐνείη *Schn.* : εἴη *Furl.* : ἐνὶ A : ἐνίαι *Camotius ap. Schn.* 5.173 7 εἰ δὲ ὁ κόπος *Furl.* : ὁ δὲ τόπος A : ὁ δὲ κόπος *Ald.* εἰ (*alt.*) *Furl.* : τοῦ A 9 ἐπιρροῇ *Wimm.*^{1,2} : τῇ ἐπιρροῇ *Schn.* 2.606 et 5.lvi et 173 : ἐπιρροῇ A 12 καὶ *ante* ὁστάγρας *add. Schn.* 4.758 14 ἀμφοτέρως *Schn.* 5.lvi et 173 : ὡς ἄμφω A καὶ γὰρ A : καὶ (*del.* γὰρ) *Schn.* 2.606 et 5.lvi et 173 15 τὴν *Furl.* 275 : κατὰ τὴν A διίκεται B S z *Ald.* : διήκεται A 16 κόπος *Furl.* : κόπου A 17 καλοῦσι *Furl.* : καλοῦ A 18 διαδοθέντος *Furl.* : διαθέντος A 19 ἐνεργῇ A : ἐνεργεῖ V 20 τούτων *Schn.* : τούτοις A 21 καμπτομένοις *Furl.* : καλυπτο-μένοις A 23 βαρύτης N S V : βαρύτις A

- γαστέρα ἐκοπίασεν οὐδε τὴν κεφαλὴν. ἄρα δὲ ὅταν καὶ ἄλλως
 πως ἢ ὑγρότης ἐπιρροῇ πάντως κόπος; οὐ γὰρ ἂν ἔτι διὰ τὴν 25
 κίνησιν. ἢ τοῦτο μὲν οὐκ ἀναγκαῖον, ἀλλὰ μᾶλλον πόνος τις
 ἀκολουθεῖ; καὶ γὰρ καθήμενοι καὶ ἐστῶτες καὶ κατακείμενοί
 φασι κοπιᾶν καὶ ἐν τῷ αὐτῷ σχήματι· καὶ ἡ πίεσις ἐπίπονον, οἶον
 4 γὰρ θλίψις καὶ πληγὴ τις. ἀλλ' ἐνίοτε δὴ καὶ ὑπὸ πλησμονῆς καὶ
 ἀγρυπνίας καὶ ὑπὸ κατάρρου φασὶ κοπιᾶν, ἅπαντα δὲ πως καὶ 30
 ταῦτα πληθὺς ὑγρότητος. ἢ τε γὰρ πλησμονὴ (μὴ) κρατοῦντος τοῦ
 σώματος, ἢ τε ἀγρυπνία κωλύει τὴν πέψιν, ὅ τε κατάρρους
 φανερά τις σύντηξις, ἢ ἀπλῶς εἰπεῖν ὑγρότης. πότερον οὖν κόπος
 ταῦτα ἢ ὡμότης ἢ διάθεσις, ὥσπερ καὶ ἐκ τῶν ὑπνῶν συμβαίνει;
 5 βαρύνονται γὰρ διὰ τὴν σύντηξιν. ἢ οὐδὲν κωλύει διὰ πλείους 35
 αἰτίας γίνεσθαι τὸν κόπον; ἐπεὶ ἐνίοτε καὶ κατεξηραμμένου τοῦ
 σώματος καὶ οὐδεμιᾶς ὑγρότητος ὑπαρχούσης οὐδαμοῦ κοπιῶσι,
 καὶ μάλιστα γ' ὡς εἰπεῖν οὔτοι, πλὴν εἴ τις ἐν τούτοις τοῖς μέρεσι
 λέγοι τὴν σύντηξιν ὑπάρχειν· ἐπεὶ ὅταν γ' ἀπλῶς ὑγρότητος
 ἐπιρροὴ γένηται τις, οὐ πάντως κόπος, ὥσπερ τοῖς ὑδρωπιῶσι τοῖς 40
 ἐπὶ καθέδρας, ὧν τὰ γόνατα καὶ οἱ πόδες οἰδοῦσιν. οὐδὲ γὰρ ὅλως
 ὅταν ὑγρανθῇ καὶ βαρυνθῇ τὸ σῶμα. σχεδὸν γὰρ πᾶσι τοῦτο
 συμβαίνει ἐν τοῖς νοτίοις.
- 6 ταῦτα μὲν οὐκ ἄγαν διορίσαι χαλεπόν. αἱ δὲ θεραπείαι
 δόξαιεν (ἂν) ἐναντίαι πως εἶναι καὶ τῶν παθῶν καὶ ἑαυταῖς, οἶον 45
 ἢ τε καθυγραίνουσα καὶ λουτροῖς καὶ ποτοῖς, εἴπερ ἐν ὑγρότητι
 καὶ συντήξει τὸ πᾶθος, καὶ (ἢ) τῷ κόπῳ λύουσα τὸν κόπον, κατὰ

36–9 cf. [Hippocratis] *De diaeta* 2.66 (t.6 p.586.10 Littré) et Galeni *librum De san. tu.* 3.5.23–5 (CMG t.5.4.2 p.86.3–19 Koch) et 3.7.11–12 (p.89.15–23) 42–3 cf. Theophr., *De ventis* 56 (p.388.1–5 Wimmer) et [Arist.], *Probl.* 1.24 862a27–8 47–8 Antiphanes ap. Athenaeum, *Deipnosoph.* 2.20 44A = fr. 300 Kock, Galeni *librum De san. tu.* 3.8.8 (CMG t.5.4.3 p.90.19 Koch) et 3.8.11 (p. 90.31–3) et Macarii *Centur.* 5.22 (Corp. Paroem. Gr. t.2 p.180.6 Leutsch et Schneidewin)

25 ἢ om. V ἐπιρροῇ *scripsi*: ἐπιρρυῇ Schn.: ἐπιρυῇ A 26 τούτῳ *ante* μᾶλλον *add.* Schn. 2.606 ὅταν *ante* πόνος *add.* Furl. 275 26–7 τις ἀκο-λουθεῖ A: τίσιν ἀκολουθεῖ Furl. 29 πληγὴ Furl.: πάγη A 31 μὴ *add.* Schn. 5.Iviii: οὐ *add.* Schn. 2.606 et 4.759 32 πέψιν A^{ms}: τρίψιν A: θρέψιν Furl. 34 ἢ (*pr.*) A: ἢ Furl. 37 οὐδαμοῦ A: ὅμως Furl. 39 λέγοι Schn.: λέγει A 40 ἐπιρροὴ B D H M N S V^a z Ald.: ἐπιρρωῇ A V R γένηται A: γίνεται Furl. ὑδρωπιῶσι D^{ac}: ὑδροπιῶσι Ald.: ὑδρωποιῶσι A D^{p.c}: ὑδρωποιοῦσι H: ἰδρωποιῶσι B R S V 41 ἐπὶ Furl.: ὑπὸ A καθέδρας A: καθέδραις Furl. 276 42 πᾶσι Ald.: πᾶσα A 44 οὐκ A: γὰρ οὐκ V R: οὖν Schn. 45 δόξαιεν A: δεῖξαιεν V ἂν *add.* Wimm.^{1,2} 47 ἢ *add.* Schn. 4.760

- too, no one ever became fatigued in the stomach or the head. Is it the case that whenever even in some other way the moisture flows in, fatigue by all means results? For it (fatigue) would no longer occur on account of movement. Or is this not necessary, but rather does some stress accompany? For those sitting and standing and lying down say they grow fatigued also (while remaining) in the same position. Pressure is stressful too, for it (feels) like a sort of crushing and a blow. But sometimes, indeed, people say they also become fatigued because of repletion and sleeplessness and catarrh. All these, too, are in some way an abundance of moisture. For repletion (occurs) when the body does <not> take charge,¹ sleeplessness prevents digestion and catarrh is clearly some colliquescence, or to speak simply, moisture. Therefore the question is whether fatigue is these things, or crudeness,² or a disposition (of abundant moisture), just as also happens as a result of (immoderate) sleeping. For people are weighed down due to colliquescence. Or does nothing prevent fatigue from occurring on account of several causes? For sometimes too when the body is dried out and there is no moisture present anywhere, people grow fatigued, and especially so to speak these people, unless someone should say that colliquescence is present in these parts.³ Moreover, whenever there is simply an influx of moisture, there is not always fatigue, just as in those with dropsy (sitting) in chairs whose knees and feet swell. For it is not true in general that fatigue occurs whenever the body becomes moist and weighed down. For the latter happens more or less to everyone during wet weather.⁴
- 6 It is not too difficult then to define these things. But the treatments would seem somehow to be opposite, both of the affections and to themselves, like (that which) thoroughly moistens by both baths and drinks, if indeed the affection consists in moisture and colliquescence, and (that which) “releases fatigue by fatigue,” according to the proverb.

¹ I.e., fails to concoct or digest food.

² “Crudeness” refers to the rawness of undigested food and to the indigestion which results from it.

³ Something seems to be omitted here, for there is no reference in what immediately precedes to “parts.”

⁴ ἐν τοῖς νοτίοις refers to the season when the prevailing winds are from the south and hence bring rain. My thanks to Tony Preus for this information.

τὴν παροιμίαν. οὐκ εἰσὶ δ' ἐναντίαι· καὶ γὰρ μαλάξεως δεῖται τὸ
κατάξηρον καὶ <τὸ> συντετηγμένον, καὶ πλείοσι τόποις ἔκκρισιν
ἐποίησε τοῦ λυποῦντος καὶ κατὰ σάρκα καὶ κατὰ κύστιν· ἢ τε 50
κίνησις καὶ ὁ πόνος ἅπαν ἐξήρανε τὸ σύντηγμα καὶ ἐξέπεψε. οὐχ
ἅπασιν δὲ οὐδὲ πάντως αἱ τοιαῦται τῶν θεραπειῶν, ἀλλ' οἷς μὴ
μεγάλοι μὴδ' ἀπὸ μεγάλων αἱ ἀρχαί.

- 7 τὰ δ' ἀντίτυπα καὶ σκληρὰ μᾶλλον ποιεῖ κόπον καὶ ἐν πορείᾳ
καὶ ἐν δρόμῳ καὶ ἐν κατακλίσει καὶ ἐν καθέδρᾳ διὰ τὸ μᾶλλον 55
ποιεῖν πληγὴν καὶ πίεσιν. τάχα δ' ἴσως καὶ τὴν συντονίαν πλείω·
κοπιαρώτερον δ' ἂν τὸ τοιοῦτο καὶ δόξειεν. ἀλλ' ἐν γε ταῖς
καθέδραις καὶ ταῖς κατακλίσεσι τὸ ὑπεῖκον καὶ ἐνδιδόν, ὅταν
ἅπαξ λάβῃ τὸ βάρος, οὐκ ἔτι ὑπεῖκει· ὥστε καὶ τοῦτο ἐχρῆν
8 ὁμοίως ἀντιπιέζειν. οὐκ ἔστι δὲ τοῦτ' ἀληθές. αἰὲ γὰρ ἔχει πως τὰ 60
τοιαῦτα ἔνδοσιν ὡς πιεστὰ τῇ φύσει· ἐπεὶ καὶ δῆλον ἐν τῷ
πλείονι χρόνῳ ποιεῖ <τὸ> ὑποκείμενον ὅτι τοιοῦτον. τὰ δ' ἀπίεστα
καὶ μὴδὲν ἐνδιδόντα τῇ θλίψει ποιεῖ τὸν κόπον. ἔτι κατὰ τὴν
κίνησιν καὶ τὴν τροπὴν τᾶλλ' ἐνδίδωσι καὶ ποιεῖ τινὰ μετα-
9 βολήν, τὰ δὲ οὐ. διὰ ταῦτα δέ πως καὶ τὰ ἐπίπεδα τῶν κοίλων 65
κοπιαρώτερα καὶ τὰ κυρτὰ τῶν ἐπιπέδων· ἢ γὰρ θλίψις
σφοδρότερον ποιεῖ καὶ μείζω τὸν πόνον ἐφ' ἓνα τόπον ἀθροίζο-
μένου τοῦ βάρους. τὸ μὲν οὖν κυρτὸν τοῦ εὐθέως, τοῦτο δὲ
μᾶλλον τοῦ κοίλου.
- 10 διότι δὲ τοὺς μηροὺς ἢ τὰς κνήμας μᾶλλον κοπιῶσιν; ὅτι 70
μάλισθ' ὁ πόνος τῇ τοῦ συνεχοῦς διαστάσει· συνεχέστερος δὲ

57–59 *Probl. 5.11 881b34–6* 66–9 *Probl. 5.11 881b28–34* 70–7 *Probl. 5.20 882b37–883a2 et 26 883b14–19* 71 *cf. Aristotelis Topica 6.6 145b2–3*

48 μαλάξεως *A^{ms}*: μαλάξεως μὲν *Schn. 4.760*: μαλ' ὀξέως *A*: μᾶλλ' ὀξέως *VR*
49 τὸ *ante* συντετηγμένον *add. Fortenbaugh* πλείοσι τόποις *Wimm.^{1,2}*: πλείω
τόπον *B D H M N S Ald.*: πλείω πότον *A VR z*: πλείω πόνον *V^a*: ἢ (*sc.* μάλαξίς)
κατὰ πλείους τόπους *Schn. 2.606*: κατὰ πλείονα τόπον *Schn. 5.lviii*: κατὰ πλείους
τόπους *Furl.* ἔκκρισιν *post λυποῦντος V^a* 50 τε *A*: δὲ *praetulit Schn. 4.760*
51 ἐξέπεψε *A*: ἐξέπεψεν *R*: ἐξέπεμψε *V V^a* 52 ἅπασιν δὲ οὐδὲ *Schn. fort. ex*
Furl. 277 qui ἅπασιν δὲ οὐδὲ *scribi voluit*: ἅπασιν οὐδὲ *A*: δὲ ἅπασιν *Furl.*
αἱ τοιαῦται *A*: αἰτιᾶται *V* θεραπειῶν *Furl.*: πατρίων *A*: πατρίως *Leon.* 56
πίεσιν *Schn. 4.761*: ἐπιθῆσιν *A* συντονίαν *Furl.*: συντομίαν *A* 57 κοπια-
ρώτερον δ' ἂν *Furl.*: κοπρότερον δὲ *A* 59 οὐκ ἔτι *A*: οὐκέτι *Wimm.¹* τοῦτο
Furl.: ταῦτα *A* 60 ἀντιπιέζειν *Furl. ap. Schn. 4.761*: ἀποπιέζειν *A* ἔστι *A*:
ἔτι *Furl.* 61 πιεστὰ *Furl.*: ἀπίεστα *A* 61 ἐπεὶ καὶ *Schn. 2.606 and 5.lviii*: καὶ
ἐπεὶ *A*: ἐπεὶ ὅτι *Schn. 4.761* 62 ποιεῖ τὸ *Schn. 2.606–7 et 5.lviii*: ποιεῖν *A*: ὑπ-
εῖκειν *Furl.*: καὶ μᾶλλον ὑπεῖκει *Schn. 4.761* τὰ δ' ἀπίεστα *Schn. 5.lviii*: τινὰ
δ' ἀπίεστα *Furl.*: τινὰ δὲ πιεστὰ *A* 64 τροπὴν *V^a*: τροφήν *A* τᾶλλ' *A*:
→

But they are not opposites. For that which is very dry and <that which> has undergone colliquescence needs softness, and in many places it⁵ discharged what was causing pain through both the flesh and the bladder. Movement and stress thoroughly dried out the colliquescence and concocted it. Yet these types of therapy are not for everyone nor all occasions but for those in whom the beginnings (of the condition) are not great nor the result of something great.

- 7 (Surfaces) which offer resistance and are hard create more fatigue in walking and in running and in lying down and in sitting because they create more of a blow and pressure. Perhaps, too, they create more tension. And such a thing would also seem more fatiguing. But in sitting and lying down, (the surface) which yields and gives way no longer yields once it takes the weight, so that this too must press back in a way
8 similar (to an unyielding surface).⁶ But this isn't true. For such things always possess "give" somehow, as things compressible by nature, since what lies beneath makes it clear, too, over a longer stretch of time that it is of this kind. But what is incompressible and lacks "give" causes fatigue by crushing. Moreover, in movement and in turning, the others give way and effect some change but the (incompressible) do
9 not. And on account of these things flat surfaces, too, are, in a way, more fatiguing than concave ones, and the convex more than the flat. For the pressure makes the stress more intense and greater, when the weight is collected in one place. Therefore, the convex (surface is more fatiguing) than the flat, and the latter more than the concave.
- 10 Why do people grow fatigued more in the thighs than the calves? Because there is stress especially owing to the separation of what is continuous.⁷ The thigh is more continuous and more naturally one,

⁵ I.e., treatment with moisture by baths and drinks.

⁶ Or perhaps "presses back with equal force," as William Fortenbaugh has suggested.

⁷ Cf. *Probl.* 5.26 883b17–19: The two thighs are more a unity than the calves.

τ' ἄλλ' B: τᾶλλ' Ald. 65 τὰ δὲ οὐ Schn.: τάδε. οὐ A 66 τὰ κυρτὰ Schn.: κατὰ-
κυρτα A: κατὰκριτα V^a 67 σφοδρότερον A: σφοδρότερος V R ποιεῖ καὶ μείζω
B D H M N S Ald.: καὶ μείζω ποιεῖ A R V V^a πόνον V^a Ald.: τόνον A 68 εὐθέως
A: εὐθέως V τοῦτο Furl.: τούτου A 69 τοῦ κοίλου Furl.: τὸ κοῖλον A 70 ἢ
Furl.: καὶ A 71 μάλισθ' ὁ πόνος A: μάλιστα πονοῦσι Schn. 2.607 et 5.lviii τῇ
Schn. 4.762 et 5.lviii: τίς A διαστάσει Schn. 2.607 et 5.lviii: διάστασις A συν-
εχέστερος Furl.: συνεχεστέρος A

καὶ συμφυέστερος ὁ μηρὸς, ἅμα δὲ καὶ ἡ τῶν νεύρων διάστασις
καὶ ἐν τούτῳ· καὶ ἐγγυτέρω τοῦ τόπου τοῦ ἔχοντος τὸ περίττωμα.
διόπερ ἂν ὑπερβάλλῃ τῇ θερμότητι διὰ τὴν κίνησιν (ἐπισπῶσιν
οἱ μῆροί) μᾶλλον καὶ πλείον. ὅτι δὲ ἡ συνάρτησις ποιεῖ συμ- 75
πάθειαν τῶν νεύρων καὶ φλεβῶν καὶ ἐκ τῶν βουβώνων δῆλον·
πληγέντων γὰρ τῶν κάτωθεν ἐνταῦθα βουβῶνες.

- 11 διὰ τί δὲ καταβαίνοντες μὲν κατάντη τοὺς μηροὺς μάλιστα
πονοῦσιν, ἀναβαίνοντες δὲ τὰς κνήμας; ὅτι κατὰ μὲν τὴν
ἀνάβασιν ὁ πόνος τῷ αἵρειν τὸ σῶμα· φόρτιον γὰρ γίνεται 80
ἱκανόν· ὃ οὖν ἅπαν ἐπικεῖται τὸ βάρος καὶ ὃ αἵρομεν τούτου
μάλισθ' ὁ πόνος, ἡ δὲ κνήμη τοιοῦτον· ἔσχατον γὰρ ἔχει μῆκος
καὶ οὐχ ὥσπερ ὁ ποὺς πλάτος, διόπερ σαλεύεται. καθάπερ οὖν
ὑπὸ τοῦ βάρους τὸν ὦμον μάλιστα πονοῦσιν, ὡς ἐπὶ τούτῳ
12 ἔχοντες τὸ βάρος, ὁμοίως καὶ τὰς κνήμας. ἐν δὲ τῷ καταβαίνειν 85
ὁ πόνος τῷ ἐπιπίπτειν τὸ σῶμα καὶ προωθεῖν παρὰ φύσιν ὥστε
καὶ ὃ μάλιστα ἐπιπίπτει καὶ σαλεύει τούτῳ μάλιστα καὶ ποιεῖ
τὸν πόνον. ὡς οὖν ἡ κνήμη (μᾶλλον) ἐν τῷ ἀναβαίνειν
κακοπαθεῖ, οὕτως ὁ μηρὸς ἐν τῷ καταβαίνειν ἐξαίρων τὸ σῶμα
ὅλον. ἀπλῶς δὲ τὰ βάρη κάτω φέρεται, ὥστε χαλεπώτερον τὸ 90

78–82 *Photius* 527a25–9 (*CB* 1.8 p. 163.4–8 *Henry*) ὅτι καταβαίνοντες μὲν τόπον
κατάντη τοὺς μηροὺς μάλιστα πονοῦσιν, ἀναβαίνοντες δὲ τὰς κνήμας, διότι
κατὰ μὲν τὴν ἀνάβασιν ὁ πόνος τοῦ αἵρειν φορτίον τὸ σῶμα γίνεται· ὃ οὖν
ἐπικεῖται τὸ βάρος καὶ ὃ αἵρεται, τούτων μάλιστα ὁ πόνος. 85–91 *Phot.*
527a29–35 (*CB* 1.8 p. 163.8–14 *Henry*) ἐν δὲ τῷ καταβαίνειν ὁ πόνος ἐν τῷ
ἐπιπίπτειν γίνεται τὸ σῶμα καὶ παρωθεῖν παρὰ φύσιν· ὥστε οὖν ὃ μάλιστα
ἐπιπίπτει καὶ σαλεύει, τούτῳ μάλιστα καὶ τὸν πόνον ἐμποιεῖ. ὡς οὖν ἡ κνήμη
μᾶλλον ἐν τῷ ἀναβαίνειν κακοπαθεῖ, οὕτως ὁ μηρὸς ἐν τῷ καταβαίνειν. διότι
δὲ τὰ βάρη κάτω φέρεται, χαλεπώτερον ἀναβαίνειν τοῦ καταβαίνειν.

73–4 cf. *Galenī librum De san. tu.* 3.5.19 (*CMG* 1.5.4.3 p. 85.28–31 *Koch*) et *Aetii*
Amideni Libros medicinales 4.38 (*CMG* 1.8.1 p. 380.22 *Olivieri*) 78–91 *Probl.*
5.19 882b15–37, 24 888a29–b1 et 40 885a27–31 88–91 *Diocles Carystius*, fr.
142 (p. 186.6–11 *Wellmann*)

72 συμφυέστερος *Furl.*: συμφυεστέρωσ *A* 73 καὶ (*pr.*) *del. Schn.* 5.Iviii
ἐγγυτέρω *Furl.*: ἐνδοτέρω *A* 74–5 (ἐπισπῶσιν οἱ μῆροί) μᾶλλον *Schn.* 2.607
(*del. τε*): τε (συσπῶσιν οἱ μῆροί) μᾶλλον *Furl. ex Probl.* 5.26 883b16–17: *vid.*
*Forst.*¹: τε μᾶλλον *A*: γε μᾶλλον *V^a* 75 συνάρτησις *Schn.* 4.762: ἀνάρτησις
A 77 βουβῶνες *Furl.*: βουβώνων *A*: βουβωνοῦνται *Coräes ap Schn.* 5.173
78 διὰ τί δὲ *A*: διότι δὲ *Ald.*: ὅτι *Phot.* τόπον *ante* κατάντη *Phot.* 79 ὅτι *A*:
διότι *Phot.* 80 τῷ *A*: τὸ *V*: τοῦ *Phot.* 80–1 τὸ σῶμα – ἱκανόν *A*: φόρτιον τὸ
σῶμα γίνεται *Phot.* 81 ἱκανόν· ὃ οὖν *Schn.*: ὃ ἱκανόν οὖν *Furl.*: ἱκανόν·
οὖν *A* ὃ αἵρομεν *Furl.*: ὀρώμενον *A*: ὃ αἵρεται *Phot.* τούτου *Furl.*: τοῦτο
A: τούτων *Phot.*: τούτῳ *Schn.* 4.763 82 ἔχει *Schn.* 5.Iviii: ἔχον *A* 84 τὸν
→

and at the same time there is separation of the sinews in this, too; and (the thighs are) nearer to the place containing residue. On this account if (residue) becomes excessive in respect of heat on account of movement, <the thighs attract it> more readily and to a greater extent. That the connection (of the thighs with one another) creates a sympathy of the sinews and vessels is also clear from the swelling of the groin.⁸ For when the parts below are struck, swelling occurs here.

- 11 Why do people going downhill feel stress especially in their thighs, but those going up in the calves? Because in going uphill the stress results from the lifting up of the body. For it becomes a considerable burden. The stress then is especially in that (part) on which all the weight rests and with which we lift. And the calf is such a part. For it has extreme length and not, like the foot, breadth, on which account it sustains the shock. Then, just as people experience stress especially in the shoulder because of the weight (which they carry), since they hold
12 the weight on it, similarly (they feel stress) also in the calves. In going downhill, however, the stress comes from the body falling and thrusting forward unnaturally so that also on what especially it falls forward and sustains the shock, on this especially it produces stress. Therefore as the calf suffers <more> in going uphill, so the thigh in going down, lifting up the whole body. Heavy things are simply carried downward, so that

⁸ Or as William Fortenbaugh has suggested, "It is clear that the connection of the sinews and vessels also produces a sympathetic reaction resulting from swollen glands."

Photius: (*I read*) that those going downhill feel stress especially in the thighs, but those going up in the calves, because in going uphill the stress results from lifting up the body as a burden. The stress then is especially in these parts on which the weight rests and by which it is lifted.

In going downhill, however, the stress comes from the falling of the body and pushing off unnaturally so that then on what it especially falls and sustains the shock, on this also it especially creates stress. Therefore as the calf suffers more in going uphill, so the thigh in going down, and because heavy things are carried downward, going uphill is more difficult than going downhill.

ὁμον *A^{p.c.}*: τῶν ὁμων *A^{a.c.}* 84–5 ὥς – ἔχοντες *Forst.*² *ex Probl.* 5.24 883a35–6: ἄτε – ἔχοντες *Wimm.*¹ xxiv: ἄτε *aut* καὶ – ἔχουσι *Schn.* 4.763: ὥστε – ἔχουσι *A* 86 τῷ ἐπιπίπτειν *A*: ἐν τῷ ἐπιπίπτειν *Schn.* 4.763: ἐν τῷ ἐμπίπτειν γίνεται *Phot.* τὸ *Furl.*: τῷ *A*: (κάτω) τὸ *Forst.*¹ *ex Probl.* 5.24 883a37 προῳθεῖν *Schn.* 2.607 *ei* 5.lviii: παρωθεῖν *A Phot.* 87 καὶ (*pr.*) *A*: οὖν *Phot.* ὧ μάλιστα *Phot.*: ὁμαλῆς *A* ἐπιπίπτει *A*: ἐμπίπτει *Phot.*: τῷ ἐκπίπτει *A*: τῷ ἐκπίπτει (κάτω) *Forst.*¹ *ex Probl.* 5.24 883a37 τοῦτω *Furl.*: τοῦτο *A* 87–8 ποιεῖ τὸν πόνον *A*: τὸν πόνον ἐμποιεῖ *Phot.* 88 μᾶλλον *add. Sch.* 4.763 *e Photio* 90 δὲ *Schn.*: τε *A*: *om. Ald.* ὥστε *om. Phot.* χαλεπώτερον *A Phot.*: χαλεπώτερα *R V^a* τὸ *om. Phot.*

ἀναβαίνειν τοῦ καταβαίνειν. * * * χαλεπώτεροι δ' οἱ περὶ τὸν θώρακα τόποι τῶν κάτω, διότι ἐγγυτέρω τοῦ πνευματικοῦ τόπου· συμβαίνει οὖν ταχὺ συνεκφλεγμαίνειν, τοῦτο δὲ ὁ πυρετός· ἡ δ' ἀπὸ τῶν σκελῶν φλεγμονή (οὐ χαλεπὴ διὰ τὸ) πόρρω εἶναι καὶ) διὰ τὸ ἀπομαραίνεσθαι θάττον.

95

13 τῷ δὲ βραχίονι κοπιαρώτερον διὰ κενῆς ρίπτειν λίθον (ἢ) ἄλλο τι βάρος, διότι σπασματωδέστερον καὶ καματωδέστερον. οὐ γὰρ ἀπερείδεται καθάπερ ὁ βάλλων πρὸς τὸν ἐν τῇ χειρὶ ὄγκον καὶ ὥσπερ ὁ πένταθλος πρὸς τοὺς ἀλτῆρας (καὶ ὁ θέων παρασείων πρὸς τὰς χεῖρας) καὶ τοὺς καρπούς. διὸ ὁ μὲν μεῖζον 100 ἄλλεται ἢ μὴ ἔχων, ὁ δὲ θάττον θεὶ ἢ (μὴ) παρασείων, ὁ δὲ ἥττον σπᾶται προπετῶς διὰ τὸ βάρος.

14 οἱ δὲ βραχεῖς περίπατοι κοπιαρώτεροι τῶν μακρῶν καὶ οἱ ὁμαλοὶ τῶν ἀνωμάτων, ὅτι πολλάκις ἴστασθαι συμβαίνει· τὸ δ' ἐν τῷ αὐτῷ σχήματι χαλεπὸν καὶ κοπῶδες, [οὐδὲν] οὐδ' ἐκεῖνο 105 ὑπεναντίον ὡς κοπιῶσί τε μᾶλλον ἐν τοῖς ὁμαλέσι χωρίοις καὶ θάττον βαδίζουσιν ἢ ἐν τοῖς ἀνωμάλοις. κοπιαρώτερον μὲν γὰρ τὸ ἐν ταύτῳ σχήματι, θάττων δ' ἡ βάδισις ἢ ἐν τῷ ἴσῳ χρόνῳ ἐλάττω τὴν ἀναφορὰν ἔχουσα. τοιαῦτη δ' ἢ ἐν τῷ ὁμαλῷ. τὸ δὲ

96–8 *Phot.* 527a35–8 (*CB* 1.8 p. 163. 15–18 *Henry*) ὅτι κοπιαρώτερον τῷ βραχίονι διὰ κενῆς ρίπτειν ἢ λίθον ἢ ἄλλο τι βάρος, διότι σπασματωδέστερον· οὐ γὰρ ἀπερείδεται καθάπερ ὁ βάλλων πρὸς τὸν ἐν τῇ χειρὶ ὄγκον.

96–102 *Probl.* 5.8 881a39–b6 99–100 *Arist.*, *De incessu animalium* 3 705a16–19.; cf. etiam *Cratetem ap. Pollux*, *Onomast.* 3.155 (= *Crates*, fr. 11 *Kock*), *Philostrati librum De gymnast.* 55 (2.278F *Kayser*), *Luciani librum qui Anacharsis inscribitur* 27 103–22 *Probl.* 5.1 880b15–28, 5.10 881b18–27, 5.12 881b37–882a2, 5.23 883a22–8, 5.35 884b8–10 et 5.40 885a14–b3

91 *inter* καταβαίνειν *et* χαλεπώτεροι *lac. statuit Regenbogen* (1403.53–4), *conferens* [*Arist.*], *Prob.* 5.9 881b7–17 92 ἐγγυτέρω *A^{p.c.}*: ἐγκυτέρω *A^{a.c.}*: ἐγγυτέρου *V^a* 94 ἀπὸ *A*: ἐπὶ *Schn.* 2.608 et 5.1viii 94–5 φλεγμονή (οὐ χαλεπὴ διὰ τὸ) πόρρω εἶναι καὶ 5.1viii> διὰ *Schn.* 2.608 95 ἀπομαραίνεσθαι *B R S V V^a Ald.*: ἀπομαραίνεται *A* 96 τῷ—κοπιαρώτερον *A*: ὅτι κοπιαρώτερον τῷ βραχίονι *Phot.* διὰ κενῆς *Furl.*: Διογένης *A* ἢ *ante* λίθον *add. Wimm.¹* xxiv e *Photio* 97 διότι *Phot.*: ἔτι *V R*: ἔστι *A* σπασματωδέστερον *Phot.*: σπασματωδέστερον *A* καὶ καματωδέστερον *om. Phot.* 99 καὶ ὥσπερ *Furl.*: ὥσπερ καὶ *A*: ὥσπερ *Ald.* ἀλτῆρας *Furl.*: ἀρτῆρας *A*: ἀλκτῆρας *Cornarius*: ἀρωτῆρας *V^a* 99–100 *post* ἀλτῆρας *Furl. inseruit* <καὶ ὁ θέων παρασείων πρὸς τὰς χεῖρας> *et om.* καὶ τοὺς καρπούς, *in qua* πρὸς *del. Schn. sed Forst.²* *cum* καὶ τοὺς καρπούς *retinet*, *Probl.* 5.8 881b4 *conferens*: καὶ τοὺς καρπούς *A* 100 μεῖζον *B R S^c V V^a Ald.*: μεῖζων *A S^{ac}* 101 ἔχων *A*: ἔχον *Furl.* θεὶ *A*: δεῖ *Wimm.¹* μὴ *add. Furl.* 102 βάρος *Ald.*: βέλος *A* 104 ἴστασθαι *A*: →

going uphill is more difficult than going down. * * * and the places around the chest are more dangerous than those below because they are nearer to the region of the lungs.⁹ It happens then that they are swiftly inflamed, and this is fever. But the inflammation which starts from the legs <is not dangerous because of being> far from (the region of the lungs), <and> because it dies down more quickly.

- 13 It is more fatiguing for the arm to throw with an empty hand than¹⁰ (to throw) a stone or any other weight because it is more convulsive and more tiring. For the arm has no support¹¹ in the way that the thrower (has support) on the weight in his hand and as the competitor in the pentathlon on the jumping weights and <the runner who swings his arms (has support) on his hands> and his wrists. For this reason the one jumps better than when he does not have (weights) and the other runs faster than when he is <not> swinging his arms and the other (the thrower) is less drawn headlong on account of the weight.
- 14 Short walks are more fatiguing than long walks and level ones more (tiring) than uneven ones, because one happens to stand still often. And (being) in the same position is difficult and fatiguing, nor is that contradictory (i.e., that level walks are more tiring), since people grow more fatigued on level ground and walk faster than on uneven ground. For (being) in the same position is more fatiguing, and the walking is swifter which, in an equal time has less lifting up. Such is walking on

⁹ The phrase τοῦ πνευματικοῦ τόπου may have a technical meaning here in view of the Peripatetic predilection for the physiological theory of *pneuma*, but I have translated it as “the region of the lungs,” as it seems to be used by Arist., *GA* 5.2 781a31 and [Arist.], *Probl.* 33.5 962a4.

¹⁰ William Fortenbaugh suggests the following alternative translation: “It is more fatiguing to make a pretense of throwing a stone or some other weight with the arm.”

¹¹ Again Fortenbaugh suggests: “For the man who pretends does not support himself in the way”

Photius: (*I read*) that it is more fatiguing for the arm to throw with an empty hand than (to throw) either a rock or some other weight, because it is more convulsing. For (the arm) has no support in the way that the thrower (has support) on the weight in his hand.

ἐφίστασθαι *Schn.* 4.765 τὸ *Furl.* : τῷ *A* 105 οὐδεν *secl. Schn.* 4.765 : καὶ οὐδέν *Furl.* 280 106 μᾶλλον *A* : μᾶλλον ἢ *Ald.* : μᾶλλον οἱ *Furl.* ὁμαλέσι *Furl.* : ὁμαλοῖσι *A* 107 βαδίζουσιν ἢ *S^{ac} Ald.* : βαδίζουσιν *A S^{pc}* 108 ταύτῳ *A* : τῷ αὐτῷ *Schn.* 4.766 : αὐτῷ *B H L M S Ald.* θάττων *Schn.* 2.608 et 5.lviii : θᾶττων *A* 109 ἔχουσα *A* : ἔχουσαν *RV*

παρ' ἐκάστην πορείαν γινόμενον (μικρὸν πολὺ) γίνεται παρὰ 110
τὰς πολλὰς.

- 15 διότι δὲ μακροὶ μὲν ὄντες οἱ περίπατοι ἐν τοῖς ὁμαλέσι
κοπιαρώτεροι τῶν ἀνωμάτων, οἱ δὲ βραχεῖς ἀκοπώτεροι; ἢ ὅτι ἢ
τε πολλὴ κίνησις ποιεῖ κόπον καὶ ἢ ἰσχυρά; τοιαύτη (δὲ ἢ)
σπασματώδης · πολλὴ δ' ἢ συνεχῆς καὶ μία. ἐν μὲν οὖν τοῖς 115
ἀνάντεσιν ἂν ἔχωσι μῆκος αἱ μεταβολαὶ ποιοῦσιν ἀνάπασιν,
ἐν δὲ τοῖς ὁμαλέσιν ἢ ὁμοιότης τοῦ σχήματος οὐ διαλαμβάνει,
ἀλλὰ συνεργάζεται πρὸς τὸ συνεχῆ τὴν κίνησιν εἶναι. ὅταν δ' ἢ
βραχεῖα, διὰ μὲν τὸ πλῆθος τῆς κινήσεως (ἐν τοῖς ἐπιπέδοις) οὐ
γίνεται κόπος, (ἐν δὲ τοῖς ἀνάντεσιν) διὰ τὸ μεταβολὴν ἰσχυρὰν 120
εἶναι καὶ ἐναντίαν τῶν κάτω καὶ ἄνω ποιεῖ κόπον. τοιαύτη δὲ ἢ
ἐν τοῖς ἀνάντεσιν · ἐν δὲ τοῖς πεδίοις τὸναντίον.

- 16 διότι ἐξονειρωκτικοὶ οἱ κοπιῶντες; ὅτι θερμὰ τε καὶ κάθυγρα
τὰ σώματα διὰ τὴν σύντηξιν, ἢ δὲ τοιαύτη διάθεσις
σπερματική. κατάκεινται δ' ὕπτιοι διὰ τὴν ἔκλυσιν · τοῦτο γὰρ 125
τὸ σχῆμα μάλιστ' ἄνισον καὶ πρὸς τὸν ἐξονειρωγμὸν συνεργεῖ.
συμβαίνει δ' αὐτοῖς καθεύδειν μὲν μᾶλλον τὴν δ' ἴσην τροφήν
ἦττον πέττειν — καίτοι ὁ ὕπνος πεπτικόν — ὅτι ἅμα τῇ τροφῇ
περιττώματος ἔχουσι πλῆθος · ὃ καὶ αὐτὸ μέτριον ὄν δυσπεπτό-

112–18 *Phot.* 527a39–b3 (*CB t.8 p. 163. 19–24 Henry*) ὅτι οἱ ὁμαλεῖς περίπατοι
τῶν ἀνωμάτων κοπιαρώτεροι, διότι ἢ πολλὴ κίνησις ποιεῖ κόπον · πολλὴ δ' ἢ
συνεχῆς καὶ μία. αἱ δ' ἀνώμαλοι κατὰ τὰς μεταβολὰς ποιοῦσιν ἀνάπασιν.
ἐν δὲ τοῖς ὁμαλέσιν ἢ ὁμοιότης τοῦ σχήματος ἀπεργάζεται συνεχῆ τὴν κίνησιν.
123–6 *Phot.* 527b4–8 (*CB t.8 p. 163. 24–8 Henry*) ὅτι ἐξονειρωκτικοὶ οἱ κοπιῶντες,
διότι θερμὰ καὶ κάθυγρα τὰ σώματα γίνεται διὰ τὴν σύντηξιν. ἢ δὲ τοιαύτη
διάθεσις σπερματική. ὅτι καὶ ὕπτιοι κατάκεινται διὰ τὴν ἔκλυσιν. συνεργεῖ
δὲ τὸ σχῆμα τοῦτο καὶ πρὸς τοὺς ἐξονειρωγμούς.

123–32 *Probl.* 5.31 884a6–15; cf. *etiam Probl.* 3.25 874b14–21, 3.33 875b39–
876a14, *et* 4.5 877a5–15 *et* *Dioclis Carystii fr.* 141 (p. 182. 17–183. 1 *Wellmann*)
125–6 cf. *Probl.* 10.16 892b15–18 *et* *Plinii Nat. hist.* 28.54

110 μικρὸν πολὺ *add. Schn.* : πολὺ *Furl.* 111 τὰς πολλὰς *Schn.* : τὰ πολλὰ *A*
112–14 διότι—ἢ τε *A* : ὅτι οἱ ὁμαλεῖς περίπατοι τῶν ἀνωμάτων κοπιαρώτεροι
διότι ἢ *Phot.* 112 ὁμαλέσι *Furl.* : ὁμαλοῖσι *A* 114 πολλὴ *A* : πολλοὶ *R V*
ἢ *A* : *om. Furl.* 114–15 καὶ — σπασματώδης *om. Phot.* 114 δὲ ἢ *add.*
Schn. : καὶ *add. Furl.* 115 μία *A Phot.* : ὁμοία *Wimm.*^{1, 2}, *sed vid. Forst.*¹, *conl.*
Probl. 5.1 880b18 115–16 ἐν — μῆκος *om. Phot.* 116 αἱ μεταβολαὶ *A* : αἱ
δ' ἀνώμαλοι κατὰ τὰς μεταβολὰς *Phot.* ὁμαλέσιν *A* : ὁμαλοῖς *V^a* 117–18
οὐ διαλαμβάνει, ἀλλὰ *om. Phot.* 118 συνεργάζεται πρὸς τὸ *A* : ἀπεργάζεται
Phot. εἶναι *om. Phot.* ἢ *Schn.* : ἢ *A* 119 κινήσεως <ἐν τοῖς ἐπιπέδοις>
οὐ *Forst.*¹, *conl. Probl.* 5.1 880b24–5 : κινήσεως οὐ *A* 120 <ἐν δὲ τοῖς
→

the level. The lifting up which occurs in each step is <small>, (but) becomes <great> when there are many of them.¹²

15 But why, when they are long, are walks on level ground more fatiguing than those on uneven ground, but when they are short, they are less fatiguing? Is it because great movement creates fatigue and so does violent (movement)? Spasmodic movement is of this kind (i.e., violent); great movement is that which is continuous and uniform. At any rate, in steep walks having length, the changes create a rest, but on level (ground) the similarity of position does not give a break, but contributes to the movement being continuous. But whenever (the walk) is short, fatigue is not created by the excess of movement <on level ground>, but because <in steep walks> there is a change which is violent and opposed, now down, now up, (the walk) creates fatigue. And such is the movement in steep walks. But on plains it is the opposite.

16 Why do fatigued people have emissions (during sleep)? Because their bodies are both warm and very moist because of the colliquescence, and such a condition is spermatic. They lie on their backs on account of exhaustion. For this position is especially uneven and contributes to the emission. It happens that they sleep in these positions more but digest an equal amount of food less — although sleep promotes digestion — because together with the nourishment they have an abundance of resi-

¹² I.e., instances of lifting up.

Photius: (*I read*) that level walks are more fatiguing than unlevel walks, because much movement produces fatigue. Great movement is that which is continuous and uniform. Uneven walks create a rest in accordance with the changes. But on level ground the similarity of position makes the movement continuous.

(*I read*) that fatigued people have emissions (during sleep) because their bodies become warm and very moist due to the colliquescence, and such a condition is spermatic, because also they lie on their backs on account of exhaustion. And this position also contributes to the emissions.

ἀνάντεσιν> διὰ Forst.¹: διὰ δὲ A τὸ B H S Ald.: τὸν A τὴν ante μεταβολὴν add. Schn. 2.608 et 5.lviii 121 τῶν A: τῶ Schn. 2.608 et 5.lviii 122 πεδίοις A^{ac} S^{ac}: πεδινοῖς Forst.² ex Prob. 880b28: παιδίοις A^{pc} B H R S^{pc} V^a Ald. 122–3 τοῦναντιον.—θέρμα Schn.: τοῦναντίον. ἐξονειρωκτικοὶ δὲ εἰσιν οἱ κοπιῶντες τοῦτ' ὅτι (διότι 280) Furl.: ὅτι ἐξονειρωτικοὶ οἱ κοπιῶντες, διότι θέρμα Phot.: τοῦθ' ὅτι θέρμα (om. τοῦναντιον.—κοπιῶντες) A 123 τε A: om. Phot.: τι V 124 γίνεται post σώματα add. Phot. 125 κατὰκείται δ' ὑπτιοι A: ὅτι καὶ ὑπτιοι κατὰκείται Phot. ἔκλυσιν A: ἔκκλυσιν V V^a 125–6 τοῦτο γὰρ τὸ σχῆμα —συνεργεῖ Schn.: καὶ τοῦτο γὰρ τὸ σχῆμα —συνεργεῖ Furl. 281: ἐν τούτῳ γὰρ τὸ σχῆμα —συνεργεῖ A: συνεργεῖ δὲ τὸ σχῆμα τοῦτο καὶ πρὸς τοὺς ἐξονειρωγμοὺς Phot. 126 ἀνίσσον A: ἀνεσις Wimm. ¹xxiv τὸν Ald.: τὴν A: τὸ Furl. 129–30 δυσπεπτότερον Schn. 2.608 et 5.lviii: δυσπεπτώτερον A

τερόν ἐστι πολλῆς τροφῆς. διὸ καὶ ἀναμιγνυμένον κωλύει 130
πέττεσθαι τὴν τροφήν. ὁ δὲ ὕπνος μᾶλλον γίνεται ἀπὸ τοῦ
πλείονος ὑγροῦ καὶ θερμοῦ καθάπερ τοῖς μεθούσι.

17 κεύουσιν δέ τινες τοὺς μὲν χειμερινοὺς (κόπους) ἀλείμματι,
τοὺς δὲ θερινοὺς λουτρῷ θεραπεύειν, τοὺς μὲν διὰ τὰς
μεταβολὰς καὶ φρίκας (τῷ θερμαίνειν), τοὺς δὲ διὰ τὴν 135
ξηρότητα τῆς ὥρας (τῷ) καθυγραίνειν· διὸ καὶ τοῖς ποτοῖς τοῦ
θέρους μᾶλλον. ἢ δ' ὀλιγοσιτία κοινὸν μὲν, οἰκειότερον δὲ τῷ
θέρει· διὰ γὰρ τὴν ὥραν ὑπὸ τῶν σιτίων θερμαίνεται.

18 διὰ τί δὲ τὰ ὑγρά σώματα κοπιαρώτερα τῶν μὴ ὑγρῶν;
ἀσθενέστερα γάρ· τὸ δὲ σκληρὸν ἰσχυρότερον μὲν, ἀπαθέσ- 140
τερον δέ, οὐ πρὸς ἅπασαν ἀπάθειαν οἷον πρὸς θραῦσιν ἢ
κάταξιν ἢ θλάσιν ἢ διάσπασιν, ἀλλὰ (πρὸς τὰ) γλισχρότερα, ὧν
ἔνια μαλακὰ καὶ ὑγρά τὴν φύσιν. ὁ δὲ κόπος ἐστὶν ἐκ σπαστικῆς
καὶ ἐκ πληκτικῆς κινήσεως· ἐν μὲν γὰρ τῇ μεταβολῇ τῆς πορείας
πάντ' ἔχει καὶ τὴν συνέχειαν παρὰ τὰ μέρη· ἐν δὲ τῇ θέσει τῶν 145
μερῶν τύπτει διὰ τὰ ὑγρά τῶν σωματῶν. καὶ γάρ τοι *** μᾶλλον
καὶ τύπτεται ἦττον διὰ *** τὰ δὲ σκληρὰ *** τούναντίον.

139–41 *Phot.* 527b8–10 (*CB* 1.8 p.163.28–164.2 *Henry*) ὅτι τὰ ὑγρά σώματα
κοπιαρώτερα τῶν σκληρῶν, διότι ἀσθενέστερα, εἰ καὶ ἄλλον τρόπον τὰ
σκληρὰ εὐθραυστότερα.

133–8 *Probl.* 1.39 863b19–28 et 5.38 884b36–885a5; cf. etiam [*Hippocratis*]
librum De diaeta 3.68 (1.6 p.596 *Littre*) et *Dioclis Carystii* fr. 141 (p.183.15–27
Wellmann)

130 κωλύει: *B D H S Ald.*: κωλύειν *A* 133 κόπους *add. Schn.* 135 *post*
φρίκας *add. Schn.* 2.608 τῷ θερμαίνειν *aut* θερμαίνοντας 136 τῷ *ante*
καθυγραίνειν (*aut* καθυγραίνοντας) *add. Schn.* 5.lviii 137 ἢ δ' ὀλιγοσιτία
Furl.: ἡδονή σιτία *A* κοινὸν *A*: <καὶ κωθωνισμὸς θέρους, τὸ μὲν ὅλως, τὸ
δὲ μᾶλλον, ὁ μὲν πότος θέρους ὅλως διὰ τὴν ξηρότητα, ἢ δὲ ὀλιγοσιτία> κοινὸν
*Forst.*², *conl. Probl.* 1.39 863b24–8 139 διὰ τί δὲ *R V V^a* διότι δὲ *A*: ὅτι *Phot.*
μὴ ὑγρῶν *B sup. lin. Ald.*: ὑγρῶν *A*: σκληρῶν *Phot.* 140 ἀσθενέστερα *B D*
V^a Ald. Phot.: ἀσθενέστερον *A* τὸ δὲ σκληρὸν ἰσχυρότερον *Schn.*: τὸ γὰρ
σκληρὸν ἰσχυρότερον *Furl.* 281: τὸ δὲ σκληρόν, τὸ δ' ἰσχυρότερον *Furl.*: τὸ
δὲ ἰσχυρότερον *A* μὲν *Ald.*: *om. A* 141 πρὸς ἅπασαν *A*: προσάπασαν *V*
N: πρὸς πᾶσαν *Furl.* 281 *post* ἀπάθειαν *add.* τὸ σκληρὸν *A* 142 *ante*
ἀλλὰ *lac. statuit Regenbogen* (1403.58) πρὸς τὰ γλισχρότερα *Sharples*: τὰ
γλισχρότερα *Furl.* 281: γλισχρότεραν *A*: γλισχρότερα *B R S^{pc} V V^a Ald.*:
γλυσχρότερα *S^{ac}* 143 ἐστὶν ἐκ (*pr.*) *A*: ἐκ *Ald.* 144 καὶ ἐκ πληκτικῆς *om. S*
πληκτικῆς *A*: πληκτικῆς *V*: ληπτικῆς *V^a*: πλυκτικῆς *Leon.* 146 *post* σωματῶν
offerunt codd. omnes et Ald. textum corruptum hiulcumque

due. And even this being moderate, it is more difficult to digest than much nourishment. On this account, too, mixed up together, it prevents digestion of the nourishment. And sleep results more from the greater amount of moisture and warmth, just as in those who are drunk.

- 17 Some people order them to give treatment for <fatigue> in winter by anointing,¹³ in summer with a bath, <to make> the former <warm> on account of the changes and shivering, but to make the latter moist on account of the dryness of the season. On this account too, (they treat) more by means of drinks in summer. And light diet is common (in both seasons) but more suitable in summer. For owing to the season one is warmed by the food.
- 18 Why are moist bodies more subject to fatigue than those which are not moist? For they are weaker. The hard body is stronger and less apt to be affected, not in relation to every absence of injury, as in relation to breaking or fracture or bruising or tearing, but <in relation to the> more elastic things, some of which are soft and moist in nature. Fatigue results from spastic and from striking movement. For in the change of movement, everything has continuity in the parts. But in the position of the parts there is pounding on account of the moist things of the bodies. For also surely * * * more and is pounded less on account of * * * but the hard things * * * the opposite * * *

¹³ Most likely “with oil,” as is clear from the parallel passages in *Probl.* 1.39 863b22 and 5.38 884b39; “oil” is implied in ἀλείμματα.

Photius: (*I read*) that moist bodies grow fatigued more than dry, because they are weaker, although in another way dry bodies are more fragile.

Notes on Individual Lines

1.1 Περὶ κόπων] The title with the genitive plural of κόπος is the reading of all manuscripts of the work except V, which has the singular κόπου. In the title of his excerpt from Theophrastus' work Photius likewise has the plural as does Diogenes Laertius in his list of Theophrastus' works (5.44 = 1.124 FHS&G).¹ In the body of his work, Theophrastus always uses κόπος in the singular. The titles of the other two opuscula in this volume—Περὶ ἰδρώτων and Περὶ ἰλίγγων—have similar uses of the plural which do not regularly admit normal plural forms in English. Περὶ κόπων can be translated as *On Fatigues*, but speakers of English almost always speak of fatigue as a singular noun; it covers any collectivity of instances or occurrences. There are likewise several similar plurals in the Hippocratic corpus, e.g., Περὶ φυσῶν, Περὶ ἀέρων, ὑδάτων, τόπων, Περὶ σαρκῶν. It is possible that the plural κόπων is Theophrastus' way of indicating that there is not only one sort of fatigue, but several.

One might then be tempted to translate the title as *On (Cases of) Fatigue*, which would perhaps indicate a survey of a range of phenomena associated with fatigue. It is also possible to translate *On (Types of) Fatigue*, which might imply a structural classification of different sorts of fatigue. But in Theophrastus' text we find neither a survey nor a structural classification. As a result, I have translated the title simply as *On Fatigue*.

The noun κόπος is cognate with the verb κόπτω, “to strike,” “to beat,” “to pound,” “to chop,” etc. The noun has a range of meaning, e.g., “toil and trouble,” “suffering,” “pain,” “weariness,” “tiredness,” “fatigue,” “exertion.” I have chosen to translate it throughout as “fatigue.” “Tiredness” is non-specific and often carries with it the notion of sleepiness. Likewise, “weariness” is more often used of mental fatigue and resignation, and is sometimes associated with discontent with some burden felt to be boring, irksome, and the like. κόπος, however, is used by Theophrastus as a technical term which has regard for fatigue due to physical exertion or expenditure of physical strength. “Fatigue” is also used of wood or metals which have weakened due to prolonged stress, which is particularly apt for the way in which Theophrastus uses κόπος.

¹ The one manuscript of Diogenes' work which does not have the plural is cod. Vat. Gr. 1302, which is cod. A of Theophrastus' *On Fatigue*! Oribasius also uses the plural Περὶ κόπων as a title of a section on fatigues in his *Selections of Medicines* 67 (CMG vol. 6.2.2 p. 231.7 Raeder).

1.2 ἐν τίνι ποθ' ὁ κόπος (ἦ) τίσιν] Furlanus' addition of ἦ here seems sound even though the manuscript reading without it could be rendered "In what (part) (τίνι) for what people (τίσιν) does fatigue primarily occur?" In what follows, however, Theophrastus mentions different parts of the body where fatigue occurs, e.g., in the blood vessels, sinews and joints, and so "part <or> parts" appears preferable.

1.2 πρώτοις, πότερον] Schneider's emendation of πρώτοις, πότερον is preferable to the manuscript readings (προτυπώτερον *A*; πρωτοτυπώτερον *H*) and the conjectures of Furlanus (πρώτον, πότερον) and Wimmer (πρώτῳ, πότερον), for πρώτοις thus modifies τίσιν as seems necessary.

1.2 Ἐπιγένης] The name is Furlanus' restoration. While the reading of *A*, Ἐπίγονος, is indeed a Greek name, I find no one by this name who might be the person to whom Theophrastus is referring. In support of his restoration, Furlanus writes (274): *sic emendavi corruptae scripturae sequutus vestigia*, Ἐπιγένης *pro* ἐπίγον (the reading of *Ald.*) *restitui, quod sciam Epigenem veterem fuisse physicum, cuius & apud Plutarchum in placitis mentio est, & Clementem Alexandrinum in Stromatis non uno loco*. The references in Clement (*Patchwork* 1.21.131.5 and 5.8.49.3) are to an author of a work *On the Poetry of Orpheus*, identified by A. le Boulluec as most likely Epigenes of Byzantium (end of the 4th century, beginning of the 3rd century B.C.).² Cohn, however, identifies him as a Greek grammarian of the 4th century B.C.³ The Epigenes in pseudo-Plutarch, *Placita* 3.2.3 (p. 367.4–5 *DG*), however, was an astrologer.⁴ On the other hand, Pliny refers to an Epigenes who said that water that has become putrid and purified seven times becomes putrid no more (*HN* 31.34). Wellmann argues that Pliny took this information from Theophrastus' *On Water*.⁵ Pliny refers earlier to an Epigenes who "denied that it was possible to live 112 years" (*HN* 7.160), but it is not certain whether this is a reference to the same

² Clément d'Alexandrie: *Les Stromates*. [SC 279] vol. 2 p.190.

³ "Epigenes," no. 16, *RE* 6 (1909) 64.68–65.33.

⁴ See Rehm, "Epigenes, no. 17," *RE* 6 (1909) p. 65.34–66.25

⁵ M. Wellmann, "Zur Geschichte der Medicin im Alterthum," *Hermes* 35 (1900) 355–6 and O. Regenbogen, "Theophrastos," *RE* Suppl. 7 (1940) 1403.61–3. This, however, does not square with our other evidence for *On Water*, although it can't be excluded that he may have made such a point there. See frs. 210–21 *FHS&G*.

physician. Wellman has placed Epigenes' *floruit* in the first half of the fourth century B.C.⁶

1.3 φλεβὶ καὶ νεύρῳ] “vessel and sinew.” φλέβες are both veins and arteries and so I have translated the word as “vessel”; νεύρα are “tendons” or, as I have rendered the word, “sinews.” Theophrastus mentions φλέβες in only one other place and in a different connection, not as a seat of fatigue (10.76). The absence of any further mention of vessels as a seat of fatigue may be an indication that Theophrastus rejects Epigenes' claim that fatigue occurs in them.

1.3 τούτου] Schneider's emendation of the manuscript reading τοῦτο to the genitive singular is surely correct; it refers to the preceding νεύρῳ, “sinew,” which is capable of movement.

1.4 ὑπερβολὴ συντήξεως διὰ κίνησιν] Furlanus, perhaps influenced by διακίνη, the reading of the Aldine edition, emended to διακινεῖ, and translated *nimia liquatio corporis agit*. In his notes he later wrote *malim pro διακινεῖ legere διατῇκει* (“melts”), *quamvis & in hoc minus mihi satis faciam* (274). Schneider emended the text without hesitation to διὰ κίνησιν which is most sensible. Theophrastus moves from the seat of fatigue to its cause, asking whether it is “an excess of colliquescence due to movement.” This will turn out to be his first favored explanation as the cause of physical fatigue in cases of overexertion or exercise.⁷ I translate σύντηξις consistently as “colliquescence” rather than “liquefaction” or “melting” which are too restrictive.⁸ The word refers to unnatural waste

⁶ See M. Wellmann, “Epigenes,” no. 18, *RE* 6 (1909) 66.26–35.

⁷ Likewise Aristotle regards κόπος as a result of colliquescence, which acts like unconcocted food, unless it is cold, *On Sleeping and Waking* 3 456b34ff.: ὁ μὲν κόπος συντητικόν, τὸ δὲ σύντηγμα γίνεται ὥσπερ τροφή ἄπεπτος, ἂν μὴ ψυχρὸν ᾖ. [Arist.], *Probl.* 5.7 881a23–7, writes that “fatigue causes colliquescence(!), and colliquescence is a residue (περίττωμα), and it is this which causes fatigue in us, for it roams around at random and attacking bones and sinews and the parts within the flesh which are of loose texture and lie open”: ἐπεὶ δὲ ὁ κόπος σύντηξιν ποιεῖ, ἡ δὲ σύντηξις περίττωμά ἐστιν, τοῦτό ἐστιν ὃ τὸν κόπον ἐν ἡμῖν ποιεῖ, πλανώμενον ἀτάκτως καὶ προσπίπτον ὅστοις τε καὶ νεύροις καὶ τοῖς ἐντὸς τῆς σαρκὸς ἀραιοῖς οὔσι καὶ ἀνεωγμένοις.

⁸ Schneider 4.757 makes the distinction between the fluid which results from colliquescence (σύντηγμα) and the action of colliquescence (σύντηξις), but Theophrastus uses σύντηγμα only once (6.41–2), more often using ὑγρότης or ἐπιρροή, thus suggesting that he is not making precise distinctions. In the *Problems* the two terms are also used without apparent distinction; cf. 5.30 884a2 (σύντηξις) and 5.31 884a13 (σύντηγμα). It seems more likely that σύντηξις has regard for both the process and the product. On a similar *vox media*, cf. the use of τῆξις in Theophrastus' *On Sweat* 30.

products produced within the body. Unlike περιττώματα, which are natural wastes left over as a surplus from nourishment, colliquescence is not usually secreted or excreted. According to Aristotle, σύντηξις is a substance which is separated (or an “abscession”) from the material which promotes growth due to unnatural dissolving.⁹ Since it is an unhealthy ἀπόκρισις, σύντηξις is considered to be always morbid (νοσώδης) and always harmful (ἀεὶ ἔβλαπτεν).¹⁰ Theophrastus proceeds to explain that κόπος is caused by this influx of fluid and has as one symptom “heaviness” (βαρύτης; 3.23), perceived especially in the sinews and joints (καμπάς; 1.10). He wonders if fatigue may not be an unnatural development in the sinew, for it is “not suited to receive moisture” (μὴ δεκτικὸν ὑγρότητος; 1.6) and infers from this that it may in fact be “some alteration” (ἐξαλλαγῇ τις; 1.7) brought about unnaturally in the parts of the body. It appears, then, that in this first section Theophrastus considers κόπος an unnatural alteration in the constitution or disposition of the body parts, especially the sinews and joints, which is effected by an influx of some colliquescence produced in or by movement.

Such a formulation, however, leaves many things unexplained. For instance, Theophrastus does not specify what actually causes the colliquescence and its influx other than that it is produced by movement. Nor does he state what sort of matter it is that is liquefied. Further, it is not made clear if any parts of the body are affected besides joints, sinews, and tendons. Are not the muscles, flesh, and other parts also affected by colliquescence and thus subject to fatigue? Despite this lack of detail, Theophrastus’ ideas are in the main sound and backed up by traditional, i.e. Hippocratic, medical theory.

That physical fatigue is caused by σύντηξις was also the view of the author of the Hippocratic treatise *On Regimen*, who wrote:

“People out of training whose flesh is moist undergo much colliquescence (σύντηξις) after exercise, as the body becomes warm. Whatever of this (colliquescence) is sweated out or is purged away with the breath causes pain to no other part of the body except that which has been emptied contrary to custom. But whatever colliquescence remains causes pain not only to the part

⁹ *Generation of Animals* 1.18 724b26ff.: σύντηγμα δὲ τὸ ἀποκριθὲν ἐκ τοῦ αὐξήματος ὑπὸ τῆς παρὰ φύσιν ἀναλύσεως.

¹⁰ Aristotle, *Generation of Animals* 1.18 726a20 and 25. But in the Aristotelian *Problems* 5.7 881a24 (see note 14, below) σύντηξις is said to be a περίττωμα, so it may sometimes be classified as a natural residue as bile at *Parts of Animals* 4.2 677a13–14; see A. L. Peck and E. S. Forster’s comments in their Loeb edition of *Parts of Animals* p. 38–9 and those of A. L. Peck in his Loeb edition of *Generation of Animals* p. lxvi.

of the body emptied contrary to custom but also to the part receiving the fluid (τὸ ὑγρόν). For it is not natural (ξύντροφον) to the body but hostile to it.”¹¹

But in regard to the seat of fatigue, it is said by the same author that “it (τὸ ὑγρόν, sc. σύντηξις) does not gather in the fleshless parts (τὰ ἄσαρκα) of the body but in the fleshy ones (τὰ σαρκώδεα), so that it causes pain to them until it passes out.”¹² There is no mention here of vessels or sinews as in Theophrastus’ explanation but only of the fleshy parts of the body as seats of fatigue.

An influx of excessive colliquescence corresponds to one of the symptomatic causes of what Galen terms “ulcerous fatigue” (ἐλκώδης κόπος), for he asserts:

“Now the ulcerous disposition occurs from an excess of thin and acrid waste products (περιττώματα) which arise in exercising from two causes, either from thicker wastes being poured out and made thin but not completely eliminated, or from liquefied fat or soft flesh. For it is necessary that by such fluids, being thin and acrid, that the skin and the flesh should be pricked (or stung) and, as it were, wounded, so that sometimes there is even shivering and some rigor, when the fluid is very acrid and abundant.”¹³

1.5 πόνος] The word has been regularly translated here as “stress,” although it, too, like κόπος, can bear a host of other meanings, including “hard work,” “exertion,” “toil,” “trouble,” “distress,” “exercise,” and in some contexts even “pain.”

1.5 βαρύνεται] The feeling of being “weighed down” and “heaviness” is a symptom of sufferers of fatigue which Theophrastus mentions several times; cf. 1.10, 3.23, 5.35, and 5.42.

1.7 ἐξαλλαγή τις] Presumably Theophrastus is thinking that fatigue caused by excess colliquescences is an alteration of the constitution or disposition of bodily parts, specifically the sinews and joints.

1.9 ἐπιρροή] With regard to the lemma, the manuscripts vary in the spelling of the word for “influx.” Here they get it correct, except it is in the nominative case when clearly an instrumental dative is needed. In 3.25 the manuscripts have ἐπιρρη (Schneider has ἐπιρρω) and in 5.40 ἐπιρρωή. I

¹¹ [Hipp.], *On Regimen* 2.66 (vol. 6 p. 582.17–584.3 Littré).

¹² *Ibid.*, p. 584.3–5.

¹³ *Hygiene* 3.5.14 (p. 85.7–14). *Taber’s Dictionary* s.v. “fatigue,” F–44, gives as primary cause “excess activity which results in the accumulation of metabolic waste products such as lactic acid.”

have consistently printed the word with the omicron rather than the omega in all instances.

1.10 καμπάς] The “joints” are named as a third seat of fatigue, together with blood vessels and sinews or tendons. See 3.22. Fatigue localized especially in the joints is reported by [Hipp.], *Epid.* 4.27 (5.127 Littré), 6.1.9 (5.270 L.), and 6.7.7 (5.340 L.). [Hippocrates] uses the term ἄρθρον for “joint” while Theophrastus has καμπή, which means a “bend” or “flexure” of a limb. Cf. Arist., *On the Movement of Animals* 1 698a17ff., *On the Progression of Animals* 7 707b9 and *History of Animals* 1.5 490a31 and 2.1 498a25. I take the terms to be synonymous.

2.10–12 λέγουσιν δὲ καὶ—καλοῦσιν] Theophrastus notes other observations made by sufferers of fatigue. “And people say that they also become fatigued in the flesh and the whole body, so that they also call bone-fatigue (ὀστεοκόπους) ‘bone-gout’ (ὀστάγρας).”¹⁴ I have not adopted Wimmer’s textual emendation of καί; here the two words are to be taken as synonyms as do LSJ s.v. ὀστάγρα II, who cite this very passage from Theophrastus’ work. Theophrastus questions whether the bones can actually be the seat of fatigue, for they, presumably like sinews or tendons, seem ill-suited to receive fluid. In spite of this, he goes on to suggest that this “bone-fatigue” occurs for two reasons: it is due 1) to the movement of the bones themselves and 2) to the penetration of the liquified influx to the bones. When this condition becomes generalized throughout the whole body, he adds, it is called “to be thoroughly worn out” (συγκεκόφθαι; 2.17).¹⁵ This phenomenon is experienced when the pain spreads to all parts, especially to the upper and lower limbs.

I find nothing similar in the Hippocratic corpus. The variant reading ὀστεοκόπου for κόπου at *Regimen in Acute Diseases* (App.) 1 (p. 262.4 Jones) is rejected by editors. According to Galen, however, such symptoms correspond to those of his third simple form of fatigue, the inflammatory (φλεγμονώδης):

¹⁴ Cf. Galen., *On Symptomatic Causes*.2.1 (7.147 Kühn). Literally the word means “a trap for the bones,” just as ποδάγρα and χειράγρα mean “a trap for the feet and hands” respectively. In his *On Crises* 2.5 (p. 134.3ff. Alexanderson), Galen speaks of a chilling and crushing effect in sufferers of tertian fever from yellow bile which is like ὀστεοκόπος. In his *On Affected Parts* 2 (vol. 8 p. 104 Kühn), Galen adds that the membranes around the bones transmit the sensation of pain to the bones. Such a condition is caused by exercise or sometimes by chilling (ψύξις) or fullness (πλήθος). In the pseudo-Aristotelian *Problems* 5.7 881a23ff., we read that σύντηξις attacks bones (see note 7, above).

¹⁵ Cf. Galen, *On Symptomatic Causes* 2.1 (7.147 Kühn).

“The third form of fatigue in which we perceive the parts as bruised and inflamed is accustomed to occur when the muscles, having been sufficiently warmed, attract some of the waste products that have been poured out. And if it happens that the same disposition occurs around the tendons and sinews, they call this affliction ‘bone-fatigue’ (ὀστόκοπον), due to the deepness of the sensation in the deeper-lying parts called tributaries (φερομένους). For the skin is superficial and the muscles take second position, surrounding the bones in a circle, the tendons being attached to the bones, so that it is reasonable that when these people suffer any of the things mentioned before, the disposition seems to be deep and around the bones themselves.”¹⁶

The modern term is “osteoscope,” fatigue locatable in the bone.¹⁷

2.15 διίκτηται] “Penetrates,” the present subjunctive of διίκνέομαι. Only B z and Ald. have the correct form; A’s διήκτηται, which the rest of the manuscripts follow, may be an error due to iotacism. The subject of the verb is either σύντηξις or ἐπιρροή. διίκνέομαι is used of the penetration of fluids; cf. Theophrastus, *Plant Explanations* 3.20.4.

2.18 διαδοθέντος] The lemma is Furlanus’ emendation of the manuscript reading διαθέντος from διατίθημι, “to arrange” or “to dispose,” neither of which makes sense in the present context concerning generalized stress in the body’s limbs. διαδοθέντος, from διαδίδωμι, means “to spread out” or “to distribute” and is a sensible change.

2.20 ἐν ταῖς σκληροκοιτίαις] Sleeping “on hard beds” is recommended in the Hippocratic *On Regimen* 3.68 as beneficial in reducing and warming the body in the winter to counteract the coldness of the season. The use of hard beds would thus seem to be a matter of deliberate medical regime. Galen, however, states that they can be a cause of disease (*Commentary on Hippocrates’ Nature of Man* 3 [vol. 15 p. 162.8 Kühn]). Theophrastus, on the contrary, appears to be referring to the stress or pres-

¹⁶ *Hygiene* 3.5.19–21 (p. 85.28–86.5 Koch).

¹⁷ *Taber’s Dictionary*, s.v. “osteoscope,” O–32, “extreme pain in the bones, esp. in syphilitic bone disease.” A sort of ‘bone-weariness’ may occur as follows: when we exercise, we not only increase the circulation of blood, but the body also produces more red blood cells. Athletes may reach a point where the bones’ ability to produce red cells is exceeded, and a generalized oxygen deficit results in the body, which could possibly be the experience called συγκεκόφθαι by Theophrastus. Some athletes report a sensation of bone fatigue or ache, distinguishable from deep muscle and tendon ache. Of course it is also true that the tendons are very well supplied with nerve endings, particularly where they are attached to the bone, so that Galen’s explanation of bone-weariness seems closer to fact. I owe this information to Tony Preus.

sure which we feel in the various parts of our upper and lower limbs when we lie down on hard beds. In the Hippocratic *Regimen in Acute Diseases* 45 it is said that “even a bed that is soft or hard, contrary to what one is used to, creates fatigue.” Theophrastus returns to hard surfaces as fatiguing in sections 7–8.

3.21–3 ἐν τοῖς καμπτομένοις μέρεσι—ἀπὸ ταύτης] Furlanus’ emendation of the manuscript reading καλυπτομένοις (“hidden”) to καμπτομένοις (“jointed”) is preferable, since Theophrastus has already mentioned the “joints” as one of the seats of fatigue (1.10). He now reiterates that fatigue occurs when colliquescence comes to the joints, and especially the most sinewy or tendinous ones, citing as one “proof” that no one has ever become fatigued in the stomach or the head, since these have no joints (2.23–4). Likewise [Aristotle], *Probl.* 5.5 880b39–881a3, remarks that the parts around the stomach are the fattest, and one of the reasons suggested is that it is the least exercised area since it has no joints.

3.23 βαρύτης] See the comment on 1.5 above.

3.24–9 ἄρα δὲ ὅταν—καὶ πληγὴ τις] At this juncture Theophrastus becomes a bit skeptical about a monolithic *syntexis*—theory and asks whether fatigue is solely caused by the influx of fluid due to motion, or if its presence is not always necessary, “for those sitting and standing and lying down say that they are fatigued also (from staying) in the same position; and compression (ἡ πίεσις) is stressful (ἐπίπονον), for it is like a crushing (θλίψις) and a blow (or impact)” (πληγὴ τις). Theophrastus is attempting to discover an example of fatigue that is caused by something other than an excess of colliquescence due to motion involved in exercise and exertion, namely, pressure (πίεσις). However, he does not pursue this very far here, merely mentioning that pressure is experienced by people who sit, stand and lie down, presumably to illustrate that fatigue can occur without movement of the parts of the body. In section 14 he will likewise consider fatigue which occurs from being in the same position while walking. In *On Sweat* 34, Theophrastus mentions, “Rubbing the arms men sweat most if they maintain the same position.” It seems that in rubbing one’s arms, both the movement and the pressure create colliquescence and therefore fatigue. But instead of dealing further with fatigue due to pressure here, Theophrastus proceeds instead to list other types of fatigue which do result from an overabundance of moisture in section 4. He picks up the topic of pressure again in sections 7–8.

3.25 ἐπιρροῇ] See the comment on 1.9 above.

4.29–31 ἀλλ' ἐνίοτε δὴ καὶ—πλῆθος ὑγρότητος] Theophrastus writes that some people report becoming fatigued due to repletion or surfeit, perhaps overeating (πλησμονή), and sleeplessness or insomnia (ἀγρυπνία). He explains πλησμονή as a situation in which “the body does <not> take charge,” and concoction does not occur properly. Schneider rightly explains that the implicit direct object of κρατοῦντος is something like τῆς τροφῆς, and accordingly inserted the necessary μή before κρατοῦντος.¹⁸

4.32 ἢ τε ἀγρυπνία κωλύει την πέψιν] In this lemma πέψιν is a marginal correction made by a second hand in A; τρίψιν was the original reading. In the copy of A which I have investigated, only πέ is clearly visible. Schneider recorded this correction (5.173) as did Burnikel (68). All other manuscripts read τρίψιν, “rubbing,” “friction,” or “massage.” But in the context of this sentence, it makes very little sense to read “sleeplessness prevents friction (or rubbing or massage).” Furlanus wanted to emend the text to θρέψιν, “nourishing,” which is clearly the sort of thing that is needed but has no manuscript authority.

Theophrastus also explains that “sleeplessness,” like “repletion,” impairs or prevents digestion and so results in an abundance of moisture which in turn produces fatigue.¹⁹ Both of these can be antecedent causes of fatigue, for both involve an impaired concoction or digestion which results in an overabundance of waste products. He does not, however, classify the waste products of these two specifically as σύντηξις but as ὑγρότης. That πλησμονή can give rise to κόπος, cf. [Hipp.], *On Regimen* 3.72 (p. 388–90 Jones) and *Places in Man* 27 (p. 67 Potter); ἀγρυπνία coupled with κόπος cf. [Hipp.], *Prognostic* 11 (p. 22 Jones) and *Prorrhetic* 1.74 (p. 186 Potter).

4.32–3 ὅ τε κατάρρους—ὑγρότης] Finally in this section, catarrh is mentioned as a cause of fatigue. We should notice that Theophrastus says that “catarrh is clearly some colliquescence (σύντηξις), or to speak sim-

¹⁸ Schneider 2.606 and 5.lviii. He cites an example from [Arist.], *Probl.* 6.1 885b18: κρατεῖ γὰρ τὸ σῶμα τῆς τροφῆς διὰ τὴν θερμασίαν.

¹⁹ Conversely, sleep aids digestion; cf. *On Fatigue* 16.102: ὁ ὕπνος πεπτικόν, and *On Sweat* 20.140: . . . συμβαίνει τὴν πέψιν διαμερίζειν τὴν ὑγρότητα καὶ τὸν ὕπνον ἐκπέττειν. In the Hippocratic *Regimen in Acute Diseases* 49 (p. 104.14–15 Jones) continual insomnia is said to make drink and food less digestible. *Problems* 11.11 900a10–11 also connects ἀπεψία with ἀγρυπνία.

ply, moisture (ὕγρότης).” Catarrh too is a predisposing cause, since it is characterized by an abundance of mucus due to inflammation of bodily membranes.²⁰

4.33–5 πότερον οὖν—διὰ τὴν σύντηξιν] Theophrastus asks further questions about the causes of fatigue. “Indigestion” or “crudeness” (ὠμότης) seems to refer to the result of overeating (πλησμονή) mentioned just before, the food not yet having been entirely digested, and the “bodily condition” or “disposition” (διάθεσις) to the earlier mention of catarrh; both of these conditions are characterized by excess waste matter. But ἐκ τῶν ὑπνῶν (4.34) is puzzling; perhaps the plural refers to sleeping patterns or to immoderate sleep, which would, in a sense, look back to sleeplessness (ἀγρυπνία).²¹ If this is correct, the sentence is meant to recapitulate or summarize this section and to conclude that these three things can cause fatigue, since they are each, although in different ways, connected with an overabundance of fluid.

5.35–6 ἢ οὐδὲν κωλύει διὰ πλείους αἰτίας γίνεσθαι τὸν κόπον;] Having presented several symptoms and apparent causes of fatigue, Theophrastus here opts ultimately for no single cause, but settles on a plurality of causes, and proceeds to enumerate conditions in which people become fatigued for different reasons.

5.36–8 ἐπεὶ ἐνίοτε καὶ κατεξηραμμένου—οὔτοι] Theophrastus continues his claim that fatigue can have several causes by observing that fatigue cannot be due only to a moist constitution, i.e., to an abundance of liquefied wastes or colliquescence, “since sometimes, too, when the body is dried out (κατεξηραμμένου) and there is no moisture anywhere, people become fatigued, and especially, so to speak, these people.” Fatigue as a result of the desiccation of the bodies of people who do customary exercises beyond moderation is described in the Hippocratic *On Regimen* 2.66 and tacked on as a fourth simple type of fatigue by Galen, στέγνωσις, a sort of constriction or stoppage characterized by dryness and thinness.²²

²⁰ *Taber’s Dictionary*, s.v. “catarrh,” C–28–9. On catarrh connected with fatigue cf. [Hipp.], *Epid.* 5.72 (p. 200 Smith), 7.39 (p. 342) and 7.69 (p. 372).

²¹ See the note on 4.32.

²² [Hipp.], *On Regimen* 2.66 (p. 362.60–7 Jones) and Galen, *Hygiene* 3.5.23–5 (p. 86.3–19 Koch), 3.7.11 ff. (p. 89.15 ff.), and 3.9.1 (p. 94.23ff.). The modern term is “ste(g)nosis”; see *Taber’s Dictionary*, s.v., S–98–9.

5.39–42 ἐπεὶ ὅταν γ' ἀπλῶς—βαρυνθῇ τὸ σῶμα] ἐπεὶ, normally “since,” is here to be translated “moreover”; see LSJ s.v. B. 4. Here Theophrastus presents a second argument to support the first sentence of section 5: 1) fatigue without moisture and 2) moisture without fatigue. Therefore, in order to show further that fatigue does not always result from an excess of fluid and the ensuing feeling of heaviness, Theophrastus adduces the example of victims of dropsy or generalized edema. They have an excess of fluid, shown by the fact that when they sit in chairs, their knees and feet swell, yet they make no complaint of fatigue.

5.42–3 σχεδὸν—ἐν τοῖς νοτίοις] Now Theophrastus adds yet another disclaimer. Having just said, “For it is not true in general that fatigue occurs whenever the body becomes moist and weighed down,” he adds: “For this happens to almost everybody during wet weather.”²³ Thus Theophrastus attacks the theory of *syntexis* as the sole cause of fatigue from both a positive and a negative standpoint: it cannot be the only cause since fatigue occurs without the presence of colliquescence in some cases, and it is not always a cause of fatigue, because those with excess moisture do not always suffer from fatigue.

6.44 ταῦτα μὲν οὐκ ἄγαν διορίσαι χαλεπὸν] Schneider’s emendation of the manuscripts’ οὐκ to οὖν is not necessary, since Theophrastus has been presenting several different definitions of fatigue and its causes. At this point he leaves off with any further definitions and turns to therapies for the types of fatigue which he has presented.

6.44–7 αἱ δὲ θεραπεῖαι—τὸ πάθος] In his treatment or therapy for sufferers of fatigue in section 6, Theophrastus is, in part, at variance with the Hippocratic therapy for fatigue. According to the latter, since fatigue is caused by excess moisture, it can be alleviated by displacing this moisture by dryness—an allopathic treatment. But Theophrastus does not speak only of allopathic but also homoeopathic treatment, for he states:

²³ ἐν τοῖς νοτίοις here means “during the rainy season” or “during wet weather,” literally “during the south winds,” i.e., when the season is wet, rather than “in the southern regions.” Thanks to Tony Preus for this interpretation. In *Problems* 26.19 942a29ff. and 26.27 943a5ff. the south wind is said to bring rain and at 26.17 942a16ff. it makes bodies moist and hot. Further, in *Problems* 1.23 862a27ff., and 26.42 945a14ff. it is said that men feel heavier and less capable of exertion when the south wind blows. There is a curious passage in the Hippocratic *On the Sacred Disease* 16 (p. 172.14ff. Jones) which relates that the south wind dulls, heats, and moistens and makes vessels of pottery change shape.

“But the treatments would seem to be somehow opposite, both of the affections and to themselves, like the one which thoroughly moistens by both baths and by drinks, if indeed the affection consists in moisture and colliquescence. . . .”

The first therapy appears to be homeopathic, since the moisture of σύντηξις is gotten rid of by application and ingestion of moisture (i.e., baths and drinks.) Theophrastus’ insertion of the εἴ- clause suggests that he was supposing that, if the cause of fatigue were drying out, presumably when the patient is suffering from a desiccated condition, this would be rather an allopathic treatment.

6.47–8 καὶ <ή> τῷ κόπῳ λύουσα τὸν κόπον, κατὰ τὴν παροιμίαν] The second therapy mentioned by Theophrastus is also homeopathic. In this one movement and exertion are prescribed, which is in accordance with the proverb “fatigue obviates fatigue.” The point of the proverb is that of driving out or getting rid of one thing by means of a thing of the same kind. English counterparts are “to fight fire with fire” and, for a hangover, “the hair of the dog (that bit you).” In Greek the notion took various forms, e.g., “a nail is knocked out by a nail (ἥλω ἦλον ἐκκρούεται) in Arist., *Pol.* 5.11 1314a5, Lucian, *Slip of the Tongue in Greeting* 7, *Schol. in Od.* 3.36 (1.122.15–16 Dindorf), and Diogenianus, *Cent.* 5.16 (*Corp. Paroem. Gr.* 1.254.23–4 Leutsch and Schneidewin), altered to “you have knocked out a peg with a peg” (πάτταλον ἐξέκρουσας παττάλῳ) by Diogenianus 5.6 (253.3) and Pollux, *Onomast.* 9.120, which was Latinized by Cicero, *Tusc. disp.* 4.75 as *clavo clavum eiciendum*, and then “to heal the fault by means of a fault” (ἀμαρτήματι θεραπεύειν τὸ ἀμάρτημα) by Diogenianus 5.16 (253.14). There is a host of other items listed by Antiphanes ap. Athen. *Sophists at Dinner* 2.21 44A = fr. 300 Kock. Besides Theophrastus’ text, however, I find the proverb concerning “fatigue” only in Antiphanes, Galen (see below), and the late (14th century) paroemio-grapher Macarius, *Cent.* 5.22 (2.180.6 Leutsch and Schneidewin). Galen, too, refers to this proverb, explaining it as follows: “. . . the so-called apotherapeutic exercise in which it is possible to make movements which are moderate in quantity and slow in quality, with many rests in between, during which one must massage the man, . . .”²⁴ A little later he asserts: “True, then, are both the (proverb) that fatigue is obviated by fatigue, whenever it seems to be necessary for the exercises of the pre-

²⁴ Galen, *Hygiene* 3.6.4 (p. 86.29–32 Koch).

ceding day to be done equally on the following day, and that rest is the remedy of fatigue.”²⁵

6.48–9 οὐκ εἰσὶ δ’ ἐναντίαί· καὶ γὰρ μαλάξεως δεῖται τὸ κατὰξηρον καὶ (τὸ) συντετηγμένον] Theophrastus says that the therapies for fatigue are not opposite. For what is very dry (τὸ κατὰξηρον) and that which has undergone colliquescence ((τὸ) συντετηγμένον)²⁶ both require “softness” (μαλάξεως; 6.48), by which we should probably understand a number of things, all of which involve treatment with moisture, e.g., gentle massage (τρίψις), anointments with oil and water, baths, drinks etc., and have salutary effects in the treatment of fatigue in cases of dessication and colliquescence. Galen recommends soft massage also: “The remedy comes from the opposite of the condition. For one eliminates the waste products and suffering stops. They will be eliminated by much soft massage (τρίψει πολλῇ καὶ μαλακῇ) with non-astringent oil,”²⁷ In the pseudo-Aristotelian *Problems*, rubbing with oil mixed with water is prescribed for removing weariness.²⁸

6.49–50 καὶ πλείοσι τόποις ἔκκρισιν ἐποίησε τοῦ λυποῦντος καὶ κατὰ σάρκα καὶ κατὰ κύστιν·] Theophrastus explains that “in many places it (softness, or treatment with moisture) discharged what was causing pain, both through the flesh and through the bladder. When he writes “through the flesh,” he most likely mean sweating, and “through the bladder” urination, for waste matters are said to be removed from the body by sweating and urination. In *On Sweat* 2, Theophrastus remarks that “when it (foreign matter) accumulates as waste in the bladder, (it) is called urine, and in the flesh sweat.”²⁹

6.50–1 ἢ τε κίνησις καὶ ὁ πόνος ἅπαν ἐξήρανε τὸ σύντηγμα καὶ ἐξέπεψε] Theophrastus adds: “Movement and stress or exertion

²⁵ *Hygiene* 3.6.11 (p. 87.16–19 Koch).

²⁶ Fortenbaugh’s addition of τὸ here is necessary, for we have two different phenomena, drying out and colliquescence.

²⁷ *Hygiene* 3.8.11 (p. 90.31–3). We may note that today various types of massages, rubdowns, whirlpool baths, and the like are prescribed for these types of fatigues.

²⁸ 5.6 881a4–11. It is said that one should not use oil by itself, for it will not penetrate but remain on the surface. Moreover, one should use a mixture of oil and water, since oil is naturally hot, and that which is hot both dries out and hardens, and dryness and hardness are both useless (ἄξυμφορον) for fatigue.

²⁹ See also *On Sweat* 13 and [Hipp.], *On Regimen* 2.66 with regard to these residues and their elimination. Aristotle, *Meteorology* 2.3 357a33ff. discusses the salinity of both residues, sweat and urine, and their excretion.

(πόνος) thoroughly dried out the colliquescence and concocted it.” Movement and exertion are what produce sweating in *On Sweat* 2. These, however, cannot be responsible for eliminating urine. The movement and exertion also appear to be a reference to the apotherapeutic exercises prescribed by the proverb “fatigue obviates fatigue.”³⁰

Only here does Theophrastus use the neuter noun σύντηγμα. I once thought that he was making a distinction between the product (τὸ σύντηγμα) and the process of the creation of colliquescence (ἡ σύντηξις). I no longer am convinced of this but rather believe that the two terms are used interchangeably by Theophrastus.

6.51–3 οὐχ ἅπασιν δὲ οὐδὲ πάντως αἱ τοιαῦται τῶν θεραπειῶν—αἱ ἀρχαί] While Galen goes on to explain at great length which type of therapy is to be used for each type of fatigue, Theophrastus, lacking any rigid system of classification of types, makes no real specifications at all, except that “these types of therapy are not for everyone (who suffers from fatigue) nor for all occasions but for those in whom the origins (of the condition) are not great, nor from great causes.” I take this to mean that the therapies he has mentioned are for those who experience fatigue in their regular, everyday activities.

In the next two sections (7–8) Theophrastus deals with things which are resistant or inflexible and hard (τὰ δ’ ἀντίτυπα καὶ σκληρὰ, 7.54) in connection with walking, running, lying down, and sitting. I have added “surfaces” to the adjectives used as substantives, to specify that Theophrastus is speaking about things upon which one runs, walks, sits, or lies. Those that are resistant and hard cause fatigue. This is because they create an impact (or “blow”) and pressure (πληγὴν καὶ πίεσιν, 7.56) and probably more tension (συντονίαν πλείω, 7.56). What Theophrastus seems to be talking about is the fatigue which comes from walking or running on a hard road, sitting on a hard, uncomfortable chair, or lying on a hard bed and the like. When πληγὴ and πίεσις were mentioned in 3.28–9, it was suggested that Theophrastus was adducing different causes of fatigue which did not involve σύντηξις, but he did not enlarge upon these in that passage. Now he mentions συντονία, which indicates tension due to contraction or constriction. Although Galen does not use the term συντονία, tension (τάσις, ἔντασις) is nevertheless the primary symptom of his second simple type of

³⁰ See above on 6.47–8.

fatigue, the tensive (τονώδης).³¹ Thus Theophrastus is evidently speaking in this section about tensive fatigue caused by inflexible and hard surfaces, and not at all due to an abundance of colliquescence on account of movement.

7.56 πίεσιν] The lemma is Schneider's emendation of the manuscripts' reading of ἐπίθεσιν, which means "an application" or "a putting on (of something)." Clearly "pressure" or "compression" (πίεσις) is what Theophrastus is writing about in this section of his treatise.

7.56 συντονίαν] The manuscripts have συντομίαν, "conciseness," which is used primarily of speech, e.g., in Plato, *Phdr.* 267B, Aristotle, *Rhet.* 3.5 1407b28. Furlanus corrected this to συντονίαν, "tension," which makes more sense. Cf. [Hipp.], *Regimen in Acute Diseases (Appendix)* 29, Plato, *Tim.* 84E and Aristotle, *HA* 5.2 540a6.

7.60 ἀντιπιέζειν] If this correction by Furlanus is correct, the word occurs only here. It seems that ἀντιπιέζειν is what is needed instead of the manuscripts' ἀποπιέζειν. The latter means "to press, squeeze, or wring outward (from some place)" which is just the opposite of what appears to be meant here. The idea is that when some object (e.g., a seat) gives way, it only gives up to a certain point and then no longer does so and is like a surface which does not yield, but rather, in fact, "presses back," ἀντιπιέζειν. For an appropriate usage of ἀποπιέζειν see Theophrastus, *On Fainting* (fr. 346.8 FHS&G) on numbness that can occur from compression of the parts when sitting; for the corresponding noun, ἀποπίεσις, see Theophrastus, *On Fire* 11 (p. 352.38 Wimmer) on the manner in which fire extinguishes itself, and 58 (p. 361.1 Wimmer).

Next in section 8 comes a discussion of things that are compressible and those that are not (πιεστά and ἀπίεστα).³² Theophrastus modifies the account which he gave in section 7; he now remarks that chairs and beds, etc., always give a little, but some do so more slowly than others. His con-

³¹ *Hygiene* 3.5.16–18 (p. 85.16–27 Koch) and 3.6.15–21 (p. 87.30–88.18).

³² Aristotle, *Meteor.* 4.9 386a30ff., provides some definitions and characteristics of items which are πιεστά, "capable of being squeezed," and ἀπίεστα, "incapable of being squeezed." Compressible things can contract into themselves when pressed. The surface changes without being broken or one part being displaced by another as happens in the case of water. Such things have empty pores which can contract into the empty space in them. He lists sponges, wax, and flesh as items which are πιεστά. ἀπίεστα items, like iron, stone, or any liquid, cannot be compressed either because they do not have pores or, if they have them, they are full of some harder material.

clusion is that non-compressible things do not have any give, they do not yield, but rather create fatigue by crushing (θλίψει, 8.63). What is wanted for treating this sort of fatigue, however, is something which will relax the sufferer and effect some change (τινὰ μεταβολήν, 8.64–5) in his bodily constitution; perhaps he is thinking of a pillow or some form of padding. Alternatively, “softness” (μάλαξις) may be what Theophrastus would recommend for treating fatigue of this sort, just as he called for in 6.48. Thus the effects of resistant and hard things will be counteracted by what is soft, compressible, yielding, or possessing “give.”

8.61 ἔνδοσιν] LSJ s.v. II. 3 translate the word as “yielding,” “giving way.” I have used the more informal English “give” in order to suggest the idea of resilient springiness which some surfaces have, e.g., a mattress.

Sections 9–16 of *On Fatigue*, which deal with individual cases of fatiguing exertions and exercises, are closely paralleled, as mentioned earlier, in the fifth book of the Aristotelian *Problems*. Due to this striking correspondence, the difficulties encountered in Theophrastus’ text may be able to be cleared up from the *Problems* (and vice versa), for the latter sometimes explain matters in greater detail.

9.65–9 διὰ ταῦτα—τοῦ κοίλου] Theophrastus’ words find a close parallel in *Probl.* 5.11. Theophrastus explains that flat surfaces are more fatiguing than concave ones, and the convex even more than the flat. This is because of the pressure or crushing effect (θλίψις, 9.66) created when the weight of the body is collected into one place. It appears that reference is to the different tiring effects of sitting or lying on different surfaces with different parts of the body and in various positions. The only difference between Theophrastus’ account and that in the *Problems* is that the latter has an additional sentence serving to explain the various contours of the body, its positions, and the different tiring effects to which it is subject.³³

10.70–3 διότι—καὶ ἐν τούτῳ] Section 10 of Theophrastus’ treatise is paralleled by two sections of the *Problems*, 5.20 and 5.26. Theophrastus explains why the thighs grow more fatigued than the calves in general. According to him, this is due to the fact that the thighs have a closer con-

³³ *Probl.* 5.11 881b32–4: τὸ γὰρ σῶμα ἡμῶν ἐστὶ περιφερέστερον ἢ εὐθύτερον, τῶν δὲ τοιούτων κατὰ πλεον ἅπτεται τὰ κοῖλα ἢ τὰ ἐπίπεδα: “For our body is more curved than straight and the concave surface touches such parts at more places than does the flat surface.”

nection with one another, i.e., in the groin, and accordingly there is “stress especially owing to the separation of what is continuous”(10.71).³⁴ The thigh is more continuous than the calf so that the sinews (and muscles) in it are also stretched and separated which causing fatigue.

In this passage διάστασις occurs twice near to one another (10.71 and 72). LSJ s.v. Ia. translate it as “parting,” “separation,” which I have followed. It bears this same meaning in Theophrastus’ *On Dizziness* 12, where he is speaking of “separation of what is present.” In *On Sweat* 32, however, where it also occurs twice, the meaning seems to be “expansion,” for Theophrastus is speaking there about expansion of breath in connection with production of sweat.

10.73 καὶ ἐγγυτέρω τοῦ τόπου τοῦ ἔχοντος τὸ περίττωμα] A second explanation as to why the thighs are more susceptible to fatigue is given. It is because the thighs are nearer to places containing the waste products, the stomach, intestines, etc., and the warmth created there in digestion affects the thighs, for they attract the waste more readily and to a greater extent. The greater stress comes from the disturbance of the continuity of the thighs with one another, for they are separated from one another by the intervening waste products, which have become excessive through warmth and movement.

In *On Sweat* 15, Theophrastus discusses “road sores” (ἐνόδια) which appear especially on the thighs of people who exert themselves in traveling on foot. Although μηρούς is a conjecture by Furlanus, it has been adopted by all later editors. Similarly in *Problems* 5.27 883b27ff. sores (ἔλκη) are said to develop on people who overexert themselves. These sores are the result of residues (περιττώματα) that are thick and cannot be excreted with sweat but instead swell up through the flesh and, since they are sharp, bitter, and salty, produce sores. Perhaps these road sores erupt on the thighs for the same reasons which Theophrastus mentions for their greater subjectivity to tiredness than the calves.

10.74–5 διόπερ ἂν ὑπερβάλλῃ—μᾶλλον καὶ πλεῖον] After κίνησιν something has been omitted in the manuscripts. Furlanus first recognized this and inserted συσπῶσιν οἱ μηροί, basing his emendation on

³⁴ Aristotle, *Topics* 6.6 145b2–3, writes: ἡ ἀλγηδὼν διάστασιν τῶν συμφύτων μερῶν μετὰ βιάς: “Pain is a separation of conjoined parts with violence.” Cf. also *Metaph.* D 6 1016a2–3, 9–12, where he specifies the thigh or calf as examples of things that are continuous (συνεχής), or one (in substance). In *Prob.* 5.26 883b17–19 it is said that the two thighs are more a unity (τὸ συμφυεῖς) than the calves.

Probl. 5.26 883b16–17. This means that the “thighs contract.” Schneider disagreed, writing: *quod ex Aristotele supplevit verbum Furlanus συσπῶσιν, habet ipsum magnam dubitationem. Nam non solum Gaza vertit attrahere possunt, sed etiam vetus interpret posuit attrahunt: igitur ἐπισπῶσιν legit scriptum, quod cum sequenti καὶ πλεῖον melius convenit. Scilicet calefacta membra cava humores attrahunt et colligunt; quod dicitur ἐπισπᾶν, non συσπᾶν, quod est contrahere et contractum brevare. Scribendum igitur hic (et in Aristotele): διὰ τὴν κίνησιν, ἐπισπῶσιν οἱ μῆροι μᾶλλον καὶ πλεῖον.*³⁵ Fatigue in the thighs, according to what Theophrastus has said up to this point, must be due to the presence of some colliquescence or waste matter in or around them, and this must be “attracted” from the excessive residue in their vicinity. When this residue comes between the thighs, it separates their continuity and causes stress and fatigue. Therefore I have printed Schneider’s emendation ἐπισπῶσιν, “attract.”

10.75–7 ὅτι δὲ ἡ συνάρτησις—βουβῶνες] The manuscripts offer ἀνάρτησις, which Schneider printed in his text. In his notes, however, he suggested that συνάρτησις is the correct reading.³⁶ ἀνάρτησις, “suspension” or “dependence,” is not what is wanted with regard to the relationship of the thighs, although in some sense one could say that the thighs are “suspended” from the trunk. Rather, συνάρτησις, “connection” or “conjunction” clearly looks back to the first part of this section, where Theophrastus wrote about the continuity of the thighs and the painful results of their separation. In the parallel passage in the *Problems*, 5.26 883b22ff. we find “Or is it (the fact that the thigh is more susceptible to fatigue) because just as the groin swells when struck on account of the connection (συνάρτησιν) of nerves and sinews, so too does the thigh.”

Here Theophrastus explains that the connection of the thighs with one another creates a sympathy among the glands and vessels of the groin (βουβῶνες).³⁷ This is shown by the fact that when the groin is struck, it

³⁵ vol. 2 p. 607.

³⁶ vol. 4 p. 762.

³⁷ That βουβῶν or βουβῶνες can mean “groin” is shown by Hipp., *Epid.* 1.3 (p. 190.90 Jones), of a man with pain in the groin 3.7 (p. 246.13 Jones), of swellings in the groin 5.46 (p. 186 Smith) a man wounded by an arrow in the groin, 7.20 (p. 325 Smith) of a redness on the thigh inside along the central vein from the groin, and *De fract.* 20 (p. 144 Withington) of bandaging a hip by winding it through the groin, and Aristotle, *History of Animals* 1.14 493b9, who calls it the part common to the thigh and abdomen, and 3.4 515a9, where he mentions the large blood vessels in the groin. Leo Medicus (*Synopsis* 72 [CMG vol. 10.4 p. 54.25–6 Renehan]) says: “They call the region below the flank *boubônes*, that is, the space on each side of the penis and testicles.” In Hipp., *Epid.* 2.2.24 (p. 42 Smith) the

responds by swelling. The groin is where the two thighs are closest to one another; when the area is hit, the vessels, veins, glands in this area are affected and respond by swelling. It is not entirely clear to me what Theophrastus is attempting to convey here; it may be another “proof” of the continuity of the thighs with one another.

In the next two sections (11–12) Theophrastus writes about the different sensations and seats of pain when one goes uphill and downhill. These are more specific inquiries about the thigh and the calf than he conducted in the preceding section. These sections find parallels in *Probl.* 5.19 and 24; they have also been partially excerpted by Photius, *Bibl.* 527a25–35. Theophrastus remarks that in descending one feels pain more in the thighs, in ascending in the calves.³⁸ He says that this is because in ascending one has to lift the weight of the entire body, which the calves do. The weight comes to rest on and is supported and lifted by the calf. In going downhill, however, our thighs feel more pain because the body falls and is thrust forward in an unnatural motion. The thigh is then the point of impact; it is forced to sustain the shock and the weight of the trunk to which it is directly attached.³⁹

12.86 προωθεῖν] The manuscripts of the treatise as well as Photius give παρωθεῖν, “to push sideways.” This is hard to reconcile with what Theophrastus is discussing in this portion of his work. Schneider, noticing that the parallel passage in the Aristotelian *Problems*⁴⁰ has προωθεῖν, emended Theophrastus’ text accordingly to προωθεῖν “to push or thrust forward,” “to propel,” which provides a more satisfactory reading in the context of the present passage.

word appears to mean “glands” of the neck; in Hipp., *On Diseases* 4.48 (7.576 Littré), *Aph.* 4.55 (p. 150.4 Jones), and *Epid.* 6.7.2 (p. 273 Smith) “glandular swelling” or “swollen glands” seems to be meant. See Flashar, 479, and L. Septalius, *Aristotelis Problemata Commentaria* (Leiden, 1632) 333–4. The *American Heritage Dictionary* gives for “bubo,” “an inflamed swelling of a lymphatic gland, especially in the area of the armpit or groin” (Boston: Houghton-Mifflin, 1978) p. 171.

³⁸ [Aristotle], *Probl.* 5.19 882b25–36, appears to be in error in saying that the pain is felt in the knees (τὰ γόνατα), but later (5.24 883a29–30) says it is in the calves (τὰς κνήμας).

³⁹ Diocles of Carystus (fr. 142, p. 186.6–11 Wellmann) makes some similar remarks about the effects of ascending and descending and sensibly recommends the use of a walking stick. In [Hipp.], *Epid.* 6.7.1 (p. 268 Smith) we read that due to weather changes around the winter solstice, “people who rode horses or did more walking or other exertion with their legs had paralytic weaknesses in the hip or legs and fatigue and pain in their thighs and calves.”

⁴⁰ *Probl.* 5.24 883a37.

12.91–5 χαλεπότεροι—θᾶττον] It is not entirely clear what this passage has to do with fatigue; perhaps it is out of place or else we have lost part of the text. I agree with Regenbogen that a lacuna of undetermined length must be indicated before χαλεπότεροι. The passage deals with pain in the trunk of the body on account of the trunk being closer to the region of the lungs.⁴¹ The lungs are quickly inflamed and become feverish. The inflammation which comes from the legs, however, is not dangerous because it is further away from the lungs and so fades away more quickly. Inflammation of the thorax and fever are associated with fatigue in [Hipp.], *Epid.* 6.2.11 (p. 230.5–6 Smith); *Epid.* 7.98 (p. 396.13ff. Smith) reports a woman who had a pain in her left thorax after nausea and fatigue and this developed into fever. In *Places in Man* 27 (p. 66.11ff. Smith) fever associated with fatigue and repletion are mentioned and some remedies prescribed, but nowhere is there mention of what Theophrastus has written. The places around the thorax are warm since the heart is nearby and so more susceptible to inflammation which, when spread out throughout the body, develops into fever. Thus when the inflammation is moved away from the places around the thorax, e.g., downward, it is presumably cooled and thus dies out and the fever goes into remission. Schneider, in defense of his textual emendation to 12.94 φλεγμονή (οὐ χαλεπή διὰ τὸ πόρρω εἶναι καὶ), wrote: *nullum vero ab inflammatione crurum periculum est, tum quia longe a principio spiritus sunt remota crura, tum quoniam inflammatio cito marcescit*.⁴² I have adopted his emendation, since the reading of the manuscripts does not give satisfactory sense.

Another new topic is introduced in section 13. It is reproduced almost verbatim, except in the form of a question, in *Probl.* 5.8 881a39–b6: “Why is it more fatiguing for the arm to throw with an empty hand (διὰ κενῆς) than when one holds a stone or some weight?”⁴³ The answer given by

⁴¹ I have translated τοῦ πνευματικοῦ τόπου as “the region of the lungs.” The Aristotelian doctrine of connate pneuma (*Movement of Animals* 10 703a11–16 and *On Breath* 2 481b19 and 3 482a23) does not come into play here. The similar phrase ὁ ἀναπνευστικός τόπος occurs in *On Sweat* 38.240 and in Photius’ excerpt from Theophrastus’ *On Fainting* 1 (fr. 345.1 FHS&G). See Fortenbaugh’s comment on *On Sweat* 1.2–4.

⁴² vol. 2 p. 608.

⁴³ διὰ κενῆς can mean two different things: 1) “with an empty hand”; this is the translation of the phrase in *Probl.* 5.8 by J. Barnes, ed., *Complete Works of Aristotle: Revised Oxford Edition*. Bollingen Ser. 71.1, vol. 2 (Princeton, 1982) 1360; Flashar, 61, translates the passage: “Warum ist es ermüdender für den Arm, mit leerer Hand zu schleudern, als mit einem Stein in der Hand?” LSJ, 938, s.v. κενός I.2, cite *Probl.* 881a39 διὰ κενῆς ρίπτειν and give: “throw without a projectile.” or 2) “in vain” or “idly”; Wimmer and Furlan opt for this translation of the Theophrastean passage: *laboriosius est brachia inani*

Theophrastus is that the former is more convulsive and tiresome (σπασματώδεςτερον καὶ καματώδεςτερον, 13.97). When one's hand is empty there is no support, but a stone or some weight provides the hand with the needed support. A comparison is made to competitors in the pentathlon who jump better when they hold lead weights (ἀλτήρας, 13.99) than when they hold nothing; the weights provide support and aid in jumping.⁴⁴ Likewise, the runner who swings his arms as he runs, thereby providing himself with support, can run faster than when he does not swing his arms.⁴⁵ The concept here is that of *vis inertiae*, that weights tend to remain at rest and so cause resistance or support. Aristotle, *Mech.* 31 858a9–11 explains: “But when a body is moving in the same direction as the pusher, it acts just as if one increased the force and speed of the mover.”

13.99–100 ὥσπερ ὁ πένταθλος πρὸς τοὺς ἀλτήρας (καὶ ὁ θεὸν παρασειῶν πρὸς τὰς χεῖρας) καὶ τοὺς καρπούς] Furlanus, Schneider, and Forster² all wanted to emend this portion of Theophrastus' text, since they found it unsatisfactory. They sought to enlarge upon Theophrastus' words by inserting a part of the parallel portion in the *Problems* (5.8 881b4) after ἀλτήρας which would read: “and the runner by swinging his arms (has support) on his hands.” This is attractive and seems necessary from what follows in the next sentence: “For this reason the one jumps better than when he does not have (weights) and the other runs faster than when he is <not> swinging his arms” In the previous sentence there is no mention of the runner in the text transmitted in the manuscripts. Thus the addition from the *Problems* improves Theophrastus' text greatly.

13.100–2 διὸ ὁ μὲν μεῖζον ἄλλεται ἢ μὴ ἔχων, ὁ δὲ θᾶττον θεῖ ἢ (μὴ) παρασειῶν, ὁ δὲ ἥττον σπᾶται προπετῶς διὰ τὸ βάρος] In 13.98–100, the examples as emended were of a thrower, a jumper, and a runner. In explaining how their performances are improved by having support, Theophrastus changes the order to jumper, runner, and

motu jactasse quam lapidem aut aliud tenendo opus (pondus Furlan). [Hipp], *Epidem.* 7.5 (p. 304.20–2 Potter) reports that the son of Cydis fell ill and after eighteen to twenty days became delirious. “He cried out if he tried to raise himself, and could not control his head; he reached out with his hands continually, looking for something in the empty air (διακενῆς θηρεῦον).” LSJ 397 also list διακενῆς as one word, although they prefer two words, and give as meanings “in vain, idly, to no purpose.”

⁴⁴ The use of stones, lead, or other metal weights in jumping is mentioned by Arist., *Progression of Animals* 3 705a16ff., Philostratus, *Gymnast.* 55, Lucian, *Anacharsis* 27, among others.

⁴⁵ Ibid.

thrower. At first, the physics of this seem rather odd: why should a thrower with a weight be less drawn headlong? The answer is probably because when he lets go of the weight, his arm and body react backward.

Furlanus's emendation of μή before παρασείων is required in the context and matches the preceding ἢ μὴ ἔχων in the case of the jumper who jumps better with weights than without them. The whole point of contention is that the runner who swings his arms runs faster than when he *does not* swing his arms, for the swinging provides him with a form of support.

Sections 14 and 15 both concern walking—short walks and long walks on even ground and on uneven ground. Two different things seem to be meant by walking on uneven or non-uniform ground (ἐν τοῖς ἀνωμάλοις, 14.107): 1) that the ground is hilly or irregular in contour and 2) that the path followed is not straight but winding or zig-zag.⁴⁶ Conversely, what is meant by even ground (ἐν τῷ ὁμαλῷ, 14.109) is 1) that the ground is flat or level and 2) that the path is straight. Theophrastus thus states what appears to be a paradox: walks which are short are more tiring than long walks, and walks on level ground or on a straight road are more tiring than those on hilly ground or on winding or zig-zag roads. The reason he gives is that we walk faster on level ground and on straight roads, maintaining the same body posture throughout and coming to a standstill less often; such continuous and uninterrupted movement is fatiguing. On the other hand, when we walk on hilly ground or on a winding path, we grow less tired because we go slower and change body posture often. This provides rest to some of the parts of the body. Here, then, we seem to have an application of the common sense principle of *maior labor, maior dolor*. Still, I do not understand what Theophrastus means when he says that “short walks are more fatiguing than long walks (14.103–4). The answer he gives, “because one happens to stand still often,” only seems to suit the second question, “why are level walks more tiring than uneven ones.” In *Prob.* 5.12 881b37–8 the same question is asked: “Why are short walks fatiguing? Is it because they are uneven? (ἢ ὅτι ἀνώμαλοί εἰσι;) For they make one come to a halt often (πολλάκις γὰρ ἵστασθαι ποιοῦσιν).” In *Prob.* 5.35 884a8–11, we read: “Why are short walks fatiguing? Is it because people often come to a halt and they move around curves in a way that is not regular (ἢ ὅτι πολλάκις συνίστανται καὶ οὐχ ὁμάλως κινεῖνται περὶ τὰς καμπάς;)?” In none of these three passages is it stated why one “often comes to a halt” on short walks. Nor is it explained why short walks must be on “uneven” ground.

⁴⁶ See Flashar 472, and Septalius 298–9.

14.106–9 κοπιῶσί τε μᾶλλον ἐν τοῖς ὁμαλέσι χωρίοις καὶ θᾶττον βαδίζουσιν ἢ ἐν τοῖς ἀνωμάλοις. κοπιαρώτερον μὲν γὰρ τὸ ἐν ταύτῳ σχήματι, θάττων δ' ἢ βάδισις ἢ ἐν τῷ ἴσῳ χρόνῳ ἐλάττω τὴν ἀναφορὰν ἔχουσα.] I puzzled over this section of the treatise for a long time. Robert Sharples gave me some suggestions which leave me less worried that I misunderstand Theophrastus. Theophrastus seems to suggest here that walking on the level is faster because the total movement has a greater horizontal and lesser vertical component and perhaps also that the speed, that is, distance covered in a given time, is greater as a scalar quantity, not a vector, in so far as the walking is more horizontal than on uneven ground.

Theophrastus claimed earlier that being in the same position is fatiguing (3.28). Now he makes this claim again in cases of walks on level ground. The idea is that in walking on the level, our body posture changes less and so we remain more in the same position than walks on uneven ground.

14.109–11 τὸ δὲ παρ' ἐκάστην πορείαν γινόμενον (μικρὸν πολὺ) γίνεται παρὰ τὰς πολλάς] The text transmitted in the manuscripts is unsatisfactory. Furlanus (280) had inserted only πολὺ from *Prob.* 5.23 883a28, which means “The lifting up which occurs in each step becomes <great> when there are many of them.” Schneider (4.765), recognizing that this was not quite sufficient for the sense needed, inserted the fuller μικρὸν πολὺ from the doublet in *Prob.* 5.10 881b26: “The lifting up which occurs in each is <small> (but) becomes <great> when there are many of them.” Bonitz was in favor of emending *Problems* 5.23 by adding <μικρὸν πολὺ>.

It is difficult to see, however, how this fits with what precedes. Theophrastus now seems to suggest that in walking on the level many small rises at each step eventually add up to a considerable total rise. It seems to be the case that when we walk on the level, our center of gravity descends again at each step after the first rising, but it is precisely the rising up that requires the effort. This seems to contradict what has just been said previously. It may be that something has fallen out of the text after τοιαῦτη δ' ἢ ἐν τῷ ὁμαλῷ (14.109) (or conversely, that something has crept in), for Theophrastus may here be commenting on walking uphill, pointing out that the total rise then is made up of several small ones. If that is indeed the case, it seems to be a point which is both obvious and irrelevant.

In section 15 Theophrastus writes that long walks on even ground or straight roads are more tiring than when they are on uneven or zig-zag roads. When such walks are short, they are less tiring, presumably because the continuity of movement is periodically interrupted somehow and the body posture changes. As mentioned earlier, continuous motion and/or remaining in the same position or posture tends to be fatiguing. In the Aristotelian *Problems*, this topic is taken up in six different sections (5.1, 10, 12, 23, 35, and 40) which, taken as a whole, provide a more satisfying and detailed explanation of the processes and tiring effects involved in the various walks and walking surfaces.

At the beginning of the *Phædrus* (227A), when he meets Socrates, Phædrus tells him that he is going for a walk outside the wall. In accordance with Acumenus, a common friend, he says that he is “taking his walk on the roads” (κατὰ τὰς ὁδοὺς ποιοῦμαι τοὺς περιπάτους); for he says that they are “less fatiguing than walks on the streets” (ἀκοπωτέρους εἶναι τῶν ἐν τοῖς δρόμοις).

The position which Theophrastus tries to develop in section 15, when coupled with what he has said in section 14 seems illogical. Robert Sharples has helped me out here, too. He suggests the following:

If A = long

B = short

a = on uneven ground

b = on level ground

> = more fatiguing

X = because one goes faster

Y = because continuous movement is more fatiguing

Z = because the changes are violent

then Theophrastus is committed to the following:

$B > A$ (14.103)

$b > a$ because of X (14.103–11)

$Ab > Aa$ (15.112–13) because of Y (15.114–18)

$Ba > Bb$ (15.113) because of Z (15.119–22)

This means that Y is a reason for $b > a$, Z is a reason for $a > b$. But whether Y or Z is the deciding factor is apparently determined by whether or not it is a case of A or B. All this seems tantamount to saying something like “we

decide what outcome we wish to have and then choose from a range of factors the one that suits that outcome best.” While Y and Z are not directly opposed to one another, they still approach the golden mean—change is less fatiguing than continuity (Y), but not if it is a violent change (Z). What I would like to see explained is that $Ba > Bb$ simply in terms of the negation of Y. This seems to be a logical step to take, i.e., if $Ab > Aa$ because of Y, $Ba > Bb$ because of not-Y. This step, however, is not in Theophrastus’ text.

15.119–20 (ἐν τοῖς ἐπιπέδοις) οὐ γίνεται κόπος, (ἐν δὲ τοῖς ἀνάντεσιν)] I have adopted both of Forster’s emendations from the parallel passage in *Probl.* 5.1 880b24–5, for without them Theophrastus’ text is incomplete. In this section he is distinguishing the different fatiguing effects of bodily movement in walking on level ground and walking on steep hills. The emendations make the comparisons explicit.

15.121–16.124 τοιαύτη δὲ ἡ ἐν τοῖς ἀνάντεσιν, ἐν δὲ τοῖς πεδίοις τοῦναντίον. διότι ἐξονειρωκτικοὶ οἱ κοπιῶντες; ὅτι θερμά τε καὶ κάθυγρα τὰ σώματα διὰ τὴν σύντηξιν] For τοῦναντίον.—κοπιῶντες all manuscripts offer the unintelligible τοῦθ’ ὅτι θερμά. Furlanus emended as follows: τοῦναντίον. ἐξονειρωκτικοὶ εἰσιν οἱ κοπιῶντες τοῦτ’ ὅτι θερμά, etc. and translated the entire passage *talīs autem est, quae per declivia loca fit. nam quae per plana contrario se habet modo. porro qui fatigantur, solent noctu genitura pollui, quod calida humidaque sint corpora propter liquationem*. Furlanus claimed that he had emended the text from the texts of Aristotle and Photius (281). It may be that he wrote τοῦναντίον from *Problems* 5.10 881b23–5 where it is said that “On level ground the raising and lowering (of the leg) is small but repeated quickly, but on uneven ground it is the opposite” (τοῦναντίον; it occurs again in the doublet passage 5.23 883a26–7). In *Problems* 5.31 884a6 we read: διὰ τί ἐξονειρωκτικοὶ εἰσιν οἱ κοπιῶντες; Photius, who does not include the previous section about walking on steep paths and flat ones (section 15), has for the beginning of section 16: ὅτι ἐξονειρωκτικοὶ οἱ κοπιῶντες, διότι θερμά, etc. In his text Schneider printed τοῦναντίον. διότι ἐξονειρωκτικοὶ οἱ κοπιῶντες, ὅτι θερμά, etc., stating in his comments (IV.767) that he interpolated words from Photius. He explains further: *scripsi tamen initio Διότι propter sequens ὅτι, et quoniam illo διότι excerptor nostri libelli saepius alibi usus fuit*. At any rate, without introduction Theophrastus asks a wholly different question here: “Why do those who are fatigued experience seminal discharges during sleep?” This

question is dealt with not only in *Problems* 5.31, but also in part in three other books of that work (3.25 and 33, 4.5, and 10.16).⁴⁷ The reason which Theophrastus gives for this involuntary emission of semen is that the production of colliquescence which has caused fatigue also makes the body warm and moist, a condition which is productive of semen. Not only this, however, but also those who are tired tend to sleep on their backs due to their weakness, a position particularly conducive to involuntary effusions. Apparently, sleeping on one's back impairs digestion in some way.⁴⁸ Moreover, the abundant colliquescence which has produced fatigue is mixed together with any nourishment one has taken in and further prevents proper digestion among other things. Thus the body tends to remain warm and moist for a longer period of time and this condition promotes the abundant collection and subsequent involuntary effusion of semen. It should be pointed out, however, that ἐξονειρωκτικός contains the word ὄνειρος, "dream," which may refer to a discharge of semen in the course of a dream and not simply nocturnal emissions.⁴⁹

16.128 ὁ ὕπνος πεπτικόν] See the comment on 4.32.

In section 17 Theophrastus returns briefly to the subject of therapy for sufferers of fatigue. This section is closely paralleled in *Problems* 5.38, which has a doublet in *Problems* 1.39.

17.133–4 κελεύουσι δὲ—θεραπεύειν] Theophrastus remarks: "Some people order them to treat winter <fatigues> with anointing, sum-

⁴⁷ Galen says that the topic of such involuntary emissions is "an Aristotelian problem," in *On Hippocrates' Epidemics* 6.3. In *Probl.* 5.31 the consumptive (οἱ φθισιῶντες) are included together with fatigued persons as being especially susceptible to these emissions.

⁴⁸ Robert Sharples has pointed out to me that Theophrastus does not explicitly say that sleeping on one's back impairs digestion or that it leads to dreams in general as opposed to ejaculatory dreams in particular. Further, he refers to the statement of Pliny, *NH* 28.54: "Theophrastus (records) that (food) is digested more quickly if one lies on one's right-hand side, but with more difficulty by those lying on their backs" (*Theophrastus [tradit] celerius concoqui dextri lateris incubitu, difficilium a supinis*) = fr. 341 FHS&G. In addition, [Aristotle] makes the strange observation in *Problems* 10.16 892b16–17 that "emission of semen takes place only on one's back" (ἐξονειρώττει δὲ οὐδὲν μὴ ὕπτιον).

⁴⁹ Arist., *Generation of Animals* 2.4 739a24–5, gives such a meaning to the word (νύκτωρ ὃ καλοῦσιν ἐξονειρώττειν). See also R. W. Sharples, *Theophrastus of Eresus: Sources for his Life, Writings, Thought & Influence: Commentary*, Vol. 5: *Sources on Biology* (Leiden: Brill, 1995) 20–1. Caelius Aurelianus, *Chron.* 4.7.80 (p. 959 Drabkin) likewise says such emissions are essentially a consequence of what the person sees while he sleeps, and results from a longing for sexual enjoyment. ἄλειμμα implies anointment with oil; see LSJ s.v. ἀλείφω.

mer ones with baths.”⁵⁰ It is explained that this is due to the fact that in winter the body undergoes changes and shivering from the cold and so needs anointing. It is not explained by Theophrastus, however, but by the author of the *Problems*, of what this anointment should consist. Anointing in winter with oil causes warmth because olive oil contains heat.⁵¹

17.134–6 τοὺς μὲν διὰ τὰς μεταβολὰς καὶ φρίκας (τῷ θερμαίνειν), τοὺς δὲ διὰ τὴν ξηρότητα τῆς ὥρας (τῷ καθυγραίνειν] Schneider saw the need to emend the text of Theophrastus to reflect the difference in treatment in winter and summer as it is put forth in the *Problems* 5.38 884b37–40. He suggested the insertion of τῷ θερμαίνειν after φρίκας (17.135), which is a clear improvement.⁵² For if we leave the text as transmitted in manuscripts, καθυγραίνειν must be understood as the purpose of each of the alternative treatments and thus makes little sense. His addition of τῷ before καθυγραίνειν seems required to match the substantive infinitive in τῷ θερμαίνειν.

17.136–7 διὸ καὶ τοῖς ποτοῖς θέρους μᾶλλον] Theophrastus explains that for fatigue in summertime baths are recommended, and even more so, drinks. This, of course, is because the body has been excessively dried out due to the season of the year and needs moistening; baths dispel dryness, and drinks do so even more quickly. Likewise, in *On Sweat* 23, Theophrastus observes that people tend to drink much liquid in the summer.

17.137–8 ἡ δ’ ὀλιγοσιτία—θερμαίνεται] Finally in this section, Theophrastus refers to diet in fatigued persons, something not mentioned previously. He states: “Light diet (ὀλιγοσιτία) is common (in both seasons), but more appropriate in summer. For owing to the season one is warmed by the food.”⁵³ While this is intelligible, Forster¹ (140) suggested that something may be missing; in *Problems* 1.39 863b19–28 we are

⁵⁰ Perhaps by “some people” Theophrastus has Diocles of Carystus in mind, for this is one of his recommendations, too (fr. 141, p. 183.15–17 Wellmann); cf. also [Hipp.], *On Regimen* 3.68 (p. 368.21ff. Jones).

⁵¹ *Probl.* 1.39 and 5.38. Cf. also 5.6, where a rubdown with water and oil is recommended. This may owe something to the similar prescriptions of Diocles (fr. 141, p. 177.13ff. Wellmann, and fr. 147, p. 189.1ff.). Aristotle elsewhere (*History of Animals* 8.26 605a27ff.) commends the use of warm water and oil in massage for pain, as does Galen, *Hygiene* 3.7.4–5 (p. 88.29–34).

⁵² Vol. 4 p. 767–8.

⁵³ Cf. Diocles of Carystus, fr. 141 (p. 183.15–23 Wellmann).

presented with a fuller text. If Theophrastus' text were enlarged by this section of *Problems*, it would read: "<Light diet and much drinking (are recommended) in summer. The former more generally (i.e., in both seasons), but the latter more in summer. Drinking is generally (common) in summer due to the dryness,> but light diet is common (in both seasons), but more appropriate in summer. For owing the season, one is warmed by the food." The differences are clear. Forster claims that the scribe of Theophrastus' text has left out the explanatory material available in the *Problems*. Due to homoeoteleuton—the double appearance of ὀλιγοσιτία—the intervening words were omitted. The manuscript reading in the case of Περὶ κόπων is not ἡ δ' ὀλιγοσιτία, but ἡδονή σιτία; ἡ δ' ὀλιγοσιτία is Furlanus' emendation, probably from one or both of the passages in the *Problems*.⁵⁴ Granted that homoeoteleuton could have occurred prior to the corruption to ἡδονή σιτία, because Theophrastus' words are intelligible as transmitted in the manuscripts, I still have resisted adopting Forster's tempting emendation. I mentioned earlier about reservations about too ready a use of the *Problems* as evidence for Theophrastus' own text.⁵⁵

The final section (18) is badly corrupted at the end in all manuscripts and winds up in an incomprehensible way. There is no help from a corresponding passage in the *Problems*. Photius does not provide much assistance either. He writes: "(I have read) that moist bodies are more subject to fatigue than hard (bodies) because they are weaker, although in another way the hard (bodies) are more easily injured (or broken)." The last clause is a paraphrase of lines 139–41 made by Photius.

The beginning of this section of Theophrastus' work, however, seems fine. The question is raised as to why moist bodies become more fatigued than those which are not moist. The simple answer given is that moist bodies are weaker. "The hard body is stronger and more unaffected, not in relation to every absence of affection,⁵⁶ as in relation to fracture or bruising or tearing, but in relation to things which are more elastic (πρὸς τὰ γλίσχρότερα),⁵⁷ some of which are soft and moist in nature"(18.140–3).

⁵⁴ *Prob.* 1.39 863b19–28 and 5.38 884b36–885a5. The latter passage is much like Theophrastus' text: ἡ δὲ ὀλιγοσιτία κοινὸν μὲν, μᾶλλον δὲ θέρους.

⁵⁵ Introduction, p. 254.

⁵⁶ This reads rather strangely, although ἀπάθειαν would seem to pick up ἀπαθέστερον; should we perhaps read πρὸς ἅπαν πάθημα ("in relation to every affection")?

⁵⁷ Robert Sharples seems right to suggest the addition of πρὸς τὰ before γλίσχρότερα rather than have to supply the words in thought.

That is, hard bodies are stronger and less affected by moisture than soft bodies, even though they are more brittle. Theophrastus does not specify what sort of being affected by elastic things it is that soft things are susceptible to while hard ones are not. I have translated γλισχρός as “elastic,” although it can mean “viscous” or “sticky.” In his *Meteorology* 4.8 385a12, Aristotle says that γλισχρός is the opposite of ψαθυρός, “friable,” or “crumbly.” As examples of substances that are γλισχρός, he lists oil (4.7 383b34), and pitch and birdlime (4.8 385b4–5).

18.143–5 ὁ δὲ—παρὰ τὰ μέρος] What follows next in this final section, however, seems unintelligible. We read: “Fatigue also results from spastic and overpowering movement (ἐκ σπαστικῆς καὶ ἐκ πληκτικῆς κινήσεως).⁵⁸ For in the change of movement (or one’s gait), all things have continuity in the parts. But in the position of the parts there is pounding on account of the moist things of the body.” This whets our appetites for further information, since we have something new here.

18.146 τύπτει] The verb is difficult to understand here.⁵⁹ What is the sort of action which “the moist things of the body” engage in? LSJ s.v. τύπτω suggest “beat, strike, smite,” but this is hardly the sort of thing which liquids do. They also give “sting,” with examples from Anacreon 3.30 (of a snake), Xenophon, *Hellenica* 4.2.12 (of wasps), and so forth. William Fortenbaugh suggested to me that one can think of the manner in which the waves of the ocean pound on the shore. I agree with him and thus have chosen to translate the verb as “pound.”

18.146–7 καὶ γάρ τοι * μᾶλλον καὶ τύπτεται ἥττον διὰ *** τὰ δὲ σκληρὰ *** τοῦναντίον]** Our hope for new material is shattered; the text becomes unreadable at this point. There are a few letters and portions of letters with wide intervening gaps and no satisfactory sense can be made of the text as transmitted. Thus, without further explanatory material or a parallel text, we are at a loss to understand what this last portion of Theophrastus’ work concerns. Moreover, we have no idea how much material has been lost and thus no idea how long the original text was.

⁵⁸ ἐκ σπαστικῆς καὶ ἐκ πληκτικῆς κινήσεως may refer to some sort of movement involving pulling and pushing.

⁵⁹ In the next line (147) it occurs again in the passive.

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INDEX OF IMPORTANT WORDS OCCURRING IN *ON FATIGUE*

(References are to sections and lines of the Greek text.)

- ἄγαν] too (difficult) 6.44
ἀγρυπνία] sleeplessness (results in fatigue) 4.30; (prevents digestion) 4.32
ἀεί] always (stress results in fatigue) 1.5; (things compressible by nature possess “give”) 8.60
ἀθροίζειν] to collect (pass., of weight in one place) 9.67–8
αἶρειν] to lift (the body in walking uphill) 11.80; (results in stress) 11.81
αἰτία] cause (pl.; of fatigue) 5.36
ἀκολουθεῖν] to accompany (stress with fatigue) 3.27
ἄκοπος] not fatiguing (comp.; of short walks) 15.113
ἄλειμμα] anointing (with oil in cases of fatigue in winter) 17.133
ἀληθής] true (neut.) 8.60
ἄλλεσθαι] to leap (of the competitor in the pentathlon) 13.101
ἀλτήρες] (lead) weights (used by jumpers) 13.99
ἀμφοτέρως] in both ways (fatigue occurs) 2.14
ἀναβαίνειν] to go uphill 11.79; 12.88; 12.91
ἀνάβασις] going uphill 11.80
ἀναμειγνύναι] to mix up (pass., nourishment and residue) 16.130
ἀνάντης] steep (of walks) 15.116, 15.120, 15.122
ἀνάπαυσις] rest (created by changes in body position in walking) 15.116
ἀναφορά] lifting up (of the body in walking) 14.109
ἄνισος] (neut.) unequal (neut., of sleeping position) 16.126
ἀντιπιάζειν] to press back (of surfaces possessing “give”) 7.60
ἀντίτυπος] resistant; τὰ ἀντίτυπα] surfaces which offer resistance 7.54
ἄνω] up, above; τὰ ἄνω μέρη] the upper parts (of the body, i.e, limbs) 2.19; up (of motions in walking) 15.121
ἄνωμάλος] uneven (of ground on which one walks) 14.104, 14.107, 15.113
ἀπάθεια] absence of injury 18.141
ἀπαθής] not apt to be affected (neut comp.; of the hard body) 18.140–1
ἅπας] all (the limbs) 2.18; (causes of fatigue) 4.30; (colliquescence) 6.51; for everyone 6.52; (the weight) 11.81; every (absence of injury) 18.141
ἀπερείδειν] to support (mid., of the thrower) 13.98
ἀπίεστος] incompressible 8.62
ἀπλῶς] simply (where there is stress there is fatigue) 1.4; (to speak) 3.21; (wherever there is an influx of moisture, there is not always fatigue) 4.33;

(wherever there is an influx of moisture, there is not always fatigue) 5.40;
(heavy things are carried downward) 12.90

ἀπομαραίνειν] to die down (pass., of inflammation) 12.95

ἀρχή] beginning (pl., of the condition of being fatigued) 6.53

ἀσθενής] weak (comp., of moist bodies) 18.140

ἄτοπος] strange (neut.) 1.7

βαδίζειν] to walk 14.107

βάδισις] walking 14.108

βάλλω] to throw (of a person throwing) 13.98

βάρος] weight 7.59; 9.68; 11.81; 11.84; 11.85; 12.90; 13.97; 13.102

βαρύνειν] to weigh down (pass., of the fatigued person) 1.5; (pass., by colliquescence) 1.10; 4.35; (of the body) 5.42

βαρύτης] heaviness (in the sinews and joints due to colliquescence) 3.23

βουβών] swelling (of the groin) 10.76; 10.77

βραχύς] long (of walks) 14.103; 15.113; 15.119

βραχίων] arm 13.96

γαστήρ] stomach (does not become fatigued since it has no joints) 3.24

γλίσχρος] elastic (comp.) 18.142

γόνυ] knee (pl.; swollen in persons with dropsy) 5.41

δεκτικός] capable of receiving (neut.; of sinew, not capable of receiving moisture) 1.6

δέχεσθαι] to receive (influx of colliquescence) 2.13; 2.15

δῆλον] (it is) clear (by observation)) 8.61; 10.76

διαδιδόναι] to spread out (pass., of stress) 2.18

διάθεσις] disposition (of abundant moisture) 4.34; condition (spermatic) 16.124

διαλαμβάνειν] to give a break or relief (of similarity of position in walking on level ground) 15.117

διάσπασις] tearing 18.142

διάστασις] separation (of what is continuous) 10.71; (of the sinews in the thigh) 10.72

διϊκνεῖσθαι] to penetrate (of colliquescence) 2.15

διορίζειν] to define (aor., the causes of fatigue) 6.44

διότι] why 10.79; 15.112; 16.123; because 12.92; 13.97

δρόμος] running 7.55

δύσπεπτος] difficult to digest (comp.; of residue) 16.129–30

ἐγγύς] near (comp., of the thighs with respect to the place containing residue)

10.73; (of the places around the chest with respect to the region of the lungs)
12.92

ἔκκλυσις] exhaustion 16.125

ἔκκρισις] discharge (of what was causing pain) 6.49

ἐκπέττειν] to concoct (of colliquescence) 6.51

ἐλάττω] less (lifting up in walking) 14.109

ἐνάντιος] opposite (of therapies) 6.45; 6.48; opposed (of change in bodily position on steep walks) 15.121; 18.143; τούναντίον] the opposite (to movement on steep walks) 15.122; (?) 18.147

ἐνδιδόναι] to give way (of surfaces) 7.58; 8.63; 8.64

ἔνδοσις] “give” (of surfaces) 8.61

ἐνεργεῖν] to engage in activity 2.19

ἐνίστε] sometimes (people become fatigued because of repletion, sleeplessness, and catarrh) 4.29; (people grow fatigued when the body is dried out) 5.36

ἐντός] within (colliquescence penetrates) 2.15

ἐξαίρειν] to lift (the body) 12.89

ἐξαλλαγή] alteration (of the bodily constitution) 1.7

ἐξονειρωγμός] (nocturnal) emission 16.126

ἐξονειρωκτικός] one who experiences nocturnal emissions 16.123

ἐπικεῖσθαι] to rest (of weight) 11.81

ἐπίπεδος] flat (surfaces) 9.65; 9.66; level ground 15.119

ἐπιπίπτειν] to fall forward (in going downhill) 12.86; 12.87

ἐπίπονος] stressful (of pressure) 3.28

ἐπιρρεῖν] to flow in (of moisture) 3.25

ἐπιρροή] influx (of colliquescence) 1.9; 2.13; 2.15; (of moisture) 5.40

ἐπισπᾶν] to attract (of the thighs) 10.74

ἔρχεσθαι] to come (colliquescence to the sinews and joints) 3.23

ἔσχατος] extreme (length) 11.82

εὐθύς] flat (of surfaces) 9.68

ἥττον] less (to be drawn headlong) 13.101; (to digest food) 16.128; (to be pounded) 18.147

θεῖν] to run 13.100; 13.99

θεραπεία] treatment (of fatigue) 6.33; 6.52

θεραπεύειν] to treat (fatigue) 17.134

θερινός] in summer (treatment of fatigue) 17.134

θερμός] warm (of bodies because of colliquescence) 16.123; (used substantively of the greater amount which results in sleep 16.132

θερμαίνειν] to warm or make warm (people shivering) 17.135; (pass., by food) 17.138

θερμότης] heat (of residue) 10.74

θέρος] summer 17.137; 17.138

θέσις] position (of the bodily parts) 18.145

θλάσις] bruising 18.142

θλίψις] crushing 3.29, 8.63, 9.16

θραύσις] breaking 18.141

θώραξ] chest 12.92

ἱκανός] considerable (burden) 11.81

ἴσος] equal (time) 14.108; (amount of food) 16.127

ἰστάναι] to stand 327; to stand still 14.104

ἰσχυρός] violent (movement) 15.114; (change) 15.120; strong (comp., of hard bodies) 18.140

καθάπερ] like (the upper and lower limbs) 2.19; just as (people experience stress in the shoulder) 11.83; (the thrower has support) 13.98; (in those who are drunk) 16.132

καθέδρα] chair 5.41; sitting (in chairs) 7.55; 7.58

καθεύδειν] to sleep 16.127

καθησθαι] to sit (and grow fatigued) 3.27

κακοπαθεῖν] to suffer (of the calf in going uphill) 12.89

καθύγρος] very moist (because of colliquescence) 16.123

καθυγραίνειν] to moisten thoroughly (by both baths and drinks) 6.46; (those suffering from fatigue in summer) 17.136

καλεῖν] to call (bone-weariness “bone-gout”) 2.12; (thoroughly worn out) 2.17

καματώδης] tiring (comp., to throw with an empty hand) 13.97

καμπή] joint (pl., of the body) 1.9–10, 3.22

κάμπτειν] to bend (pass., of the jointed parts of the body) 3.21

καρπός] wrist (provides the runner with support) 13.100

καταβαίνειν] to go downhill (participle 1178, 12.85, 1289, 12.91

κατακεῖσθαι] to lie down 3.28; (on one’s back on account of exhaustion) 16.125

κατάκλισις] lying down 7.55, 7.58

κατάντης] downhill 11.78

καταξηραίνειν] to dry up completely (pass., of the body) 5.36

κατάξηρος] very dry; τὸ κατάξηρον] that which is very dry 6.49

κάταξις] breaking or fracture 18.142

κατάρρος] catarrh (as a cause of fatigue) 4.30, 4.32

κάτω] down, downward 12.90; 15.121; τὰ κάτω μέρη] the upper parts (of the body, i.e., limbs) 2.19; οἱ κάτω τόποι] the places below (the chest) 12.92

- κάτωθεν]** below; **τὰ κάτωθεν]** the parts below 10.77
κελεύειν] to order 17.133
κενός] empty (to throw with an empty hand) 13.96
κεφαλή] head (does not become fatigued since it has no joints) 3.24
κινεῖν] to move 2.13; (pass.) 2.13; 2.14
κίνησις] movement, motion (of sinew) 1.4; (results in excess colliquescence) 1.4; (of bodily parts) 1.7–8; (causes influx of colliquescence) 1.8–9; (may not always cause fatigue) 3.25–6; (dried out and concocted colliquescence) 6.51; (effect change in surfaces with “give”) 8.64; (creates heat) 10.74; (great and violent) 15.114; (spasmodic) 15.115; (continuous in walking on level ground) 15.118; (even if excessive on short walks on level ground does not create fatigue) 15.119; (of a striking nature) 18.144
κνήμη] calf of the leg (less subject to fatigue than the thigh) 10.70; (experience more stress than thighs in going uphill) 11.79; (carries and lifts weight of the body in climbing) 11.82; (feels stress from bearing the weight of the body) 11.85; (suffers more than the thigh in going uphill) 12.88
κοίλος] convex (surface) 9.65; 9.69
κοινός] common (light diet in both summer and winter) 17.137
κοπιᾶν] to be or become fatigued 1.5; 1.10; 2.11; 3.24; 3.28; 4.30; 5.37; 10.70; 14.106; 16.123
κοπιάρός] fatiguing (comp., because of more tension) 7.57; (flat surfaces than concave) 9.66; (to throw with an empty hand than to throw a stone or other weight) 13.96; (short walks than long walks) 14.103; (being in the same position) 14.107; (walks on level ground than uneven ground) 15.113; subject to fatigue (comp., moist bodies than those not moist) 18.139
κόπος] fatigue 1.1 (*inscr.*); 1.2; 1.5; 1.6; 1.7; 18; 2.12; 2.16; 3.25; 4.33; 5.36; 5.40; 5.47 (twice); 7.54; 8.53; 15.114; 15.120; 15.121; 17.133; 18.143
κοπώδης] fatiguing (neut., being in the same position) 14.105
κρατεῖν] to take charge, i.e. concoct food (of the body) 4.31
κυρτός] convex (surface) 9.66, 9.68
κύστις] bladder (through which what was causing pain was discharged) 6.50
κωλύειν] to prevent 2.14; (digestion) 4.32; (fatigue from occurring on account of several causes) 5.35; (digestion) 16.130
- λαμβάνειν]** to take (the weight) 7.59
λίθος] stone (to throw) 13.96
λουτρόν] bath (treatment by moistening) 6.46; (treatment for fatigue in summer) 17.134
λύειν] to release (fatigue by fatigue; proverb) 6.47
λυπεῖν] to cause pain 6.50
- μακρός]** long (of walks) 14.103, 15.112

- μαλακός]** soft (nature of elastic things) 18.143
μάλαξις] softening (by means of massage) 6.48
μάλιστα] superl. adv., vid. **μᾶλλον**; especially (to be weighed down and fatigued) 1.10; (fatigue occurs in parts of body with which one engages in activity) 2.19; (fatigue occurs in jointed parts) 3.21; (fatigue occurs in people whose bodies are dried out) 538; (feel stress in the thighs in going downhill) 11.78; (stress is felt in the part on which weight rests) 11.82; (experience stress in the shoulder when carrying a weight) 11.84; (stress experienced on what the body falls forward on in going down hill) 12.87 (twice); (sleeping on one's back is uneven) 16.126
μᾶλλον] more (fatigue) 7.54; (of a blow and pressure) 7.55; (than the concave) 9.69; (grow fatigued) 10.70; (calf suffers) 12.88; (grow fatigued on level ground) 14.106; (people sleep on their backs) 16.127; (sleep results from greater moisture and warmth) 16.131; (to treat by drinks in summer) 17.137; (?) 18.146; more readily (the thighs attract residue) 10.75; but rather 3.26; vid. **μάλιστα**
μέγας] great (beginnings of the condition) 6.53 (twice); (comp., pressure makes stress) 9.67; better (of the jumper who has weights) 13.100
μεθύειν] to be drunk 16.132
μέρος] part of the body (stress is spread out to) 2.18; (jointed) 3.21; (colliquescence present in) 5.38; (continuity in) 18.145; (position of) 18.146
μεταβολή] change (effected in surfaces with "give") 8.64–5; (pl., in long, steep walks create a rest) 15.116; (to violent and opposed movement) 15.120; (in bodily warmth) 17.135; (of movement) 18.144
μέτριος] moderate (neut.; of residue) 16.129
μῆκος] length (of the thigh) 11.82; (of steep walks) 15.116
μηρός] thigh (more subject to fatigue than the calf) 10.70; (more continuous and naturally one than the calf) 10.72; (attract residue more readily) 10.75; (feel stress especially in going downhill) 11.78; 12.89
μία] uniform (of great movement) 15.115
μικρός] small (of lifting up which occurs in each step) 14.110
μόριον] part (of the body, pl.) 2.20

νεύρον] sinew (experiences fatigue?) 1.3 (twice); (not suited to receive moisture) 1.6; (colliquescence comes to) 3.22; (separation of) 10.72; (sympathy with vessels) 10.76
νευρώδης] sinewy (superl., of parts of the body) 3.22
νότιος] south wind (pl., bring wet weather) 5.43

ξηραίνειν] to dry out (colliquescence, aor.) 6.51
ξηρότης] dryness (of the season) 17.136

- ὄγκος]** weight (which provides the thrower with support) 13.98
οἰδεῖν] to swell (of the feet and legs of sufferers of dropsy) 5.41
οἰκεῖος] suitable (comp., of light diet in the summer) 17.137
οἶος] like (the therapy which moistens); 6.45; as (in relation to various injuries) 18.141
ὀλιγοσιτία] light diet (more common in summer) 17.137
ὅλος] whole (body) 1.11; 2.17; adv., in general (not true) 12.90;
ὁμαλός] level (walks) 14.104; (ground) 14.106; 14.109; 15.112; 15.117
ὁμοιότης] similarity (of bodily position) 15.117
ὀστάγρα] bone-gout 2.12
ὀστεοκόπος] bone-fatigue 2.12
ὀστέον] bone 2.12, 2.16
οὐδαμοῦ] not anywhere (of the presence of moisture in the body) 5.37

πάθος] affection (pl., opposite to treatments) 6.45; (consisting in moisture and colliquescence) 6.47
παρασεῖν] to swing (of the arms in running) 13.100, 13.101
παροιμία] proverb 6.48
πεδίον] plain (i.e., flat surface on which one walks) 15.122
πένταθλος] competitor in the pentathlon 13.99
πεπτικός] promoting digestion (of sleep) 16.128
περίπατος] walking 14.103, 15.112
περίττωμα] residue 10.73, 16.129
πέττειν] to concoct (an equal amount of food); 16.128; (pass., of nourishment) 16.131
πέψις] concoction (prevented by sleeplessness) 4.32
πίεσις] pressure (is stressful) 3.28; (created by resistant surfaces) 7.56
πιεστός] compressible 8.61
πλάτος] breadth (of the foot) 11.83
πλεῖων] comp. of **πολύς**; several (causes) 5.35; many (places) 6.49; more (tension) 7.56; longer (stretch of time) 8.62; to a greater extent (the thighs attract residue) 10.75; greater (amount of moisture) 16.132
πλήττειν] to strike (pass., of the parts below) 10.77
πληγή] a blow (what pressure feels like) 3.29; (created by resistant surfaces) 7.56
πληθος] magnitude (of stress) 2.16; abundance (of moisture) 4.31; excess (of movement) 15.119; abundance (of residue) 16.129
πληκτικός] striking (movement) 18.144
πλησμονή] repletion, being filled (with food) 4.29, 4.31
πνευματικός] of the lungs 12.92
ποιεῖν] 6.50, 7.54, 7.56, 8.62, 8.63, 8.64, 9.67, 10.75, 12.87, 15.114, 15.116, 15.121 **πολλάκις]** often (to stand still) 14.104

- πολύς]** great (lifting up) 14.110; movement 15.114 15.115; many (steps) 14.111
- πονεῖν]** to feel stress (in thighs when going downhill) 11.79; to experience stress (in the shoulder when carrying a weight) 11.85
- πόνος]** stress 1.5, 1.8, 2.16, 2.18, 3.26, 6.51, 9.67, 10.71, 11.80, 11.82, 12.86, 12.88
- πορεία]** walking 7.54; step, pace (in walking) 14.110; movement (change of) 18.144
- πόρρω]** far from (the region of the lungs) 12.94
- πότος]** drink (pl., for treatment of fatigue) 6.46; (more in summer) 17.136
- ποῦς]** foot (plural; of sufferers of dropsy) 5.41, (sing.; has breadth) 11.83
- προπετώς]** headlong (to draw a thrower) 13.102
- προωθεῖν]** to thrust forward (of the body) 12.86
- πυρετός]** fever 12.93
- ρίπτειν]** to throw 13.196
- σαλεύειν]** to sustain the shock (of the calf) 11.83; 12.87
- σάρξ]** flesh (to become fatigued in) 2.11; 2.16–17; (discharge of what causes pain; by sweating?) 6.50
- σιτίον]** food (pl., by which one is warmed) 17.138
- σκέλος]** leg (inflammation arising from) 12.94
- σκληροκοιτία]** use of hard beds 2.20
- σκληρός]** hard (surface) 7.54; (of a body) 18.140; (pl.) 18.147
- σπασματώδης]** convulsive (comp., of movement in throwing) 13.97; (of violent movement in walking) 15.115
- σπαστικός]** spastic, spasmodic (of movement) 18.143
- σπᾶν]** to draw (pass., headlong, of a thrower) 13.102
- σπερματικός]** spermatic, productive of semen (of a warm and moist condition because of colliquescence) 16.125
- συγκόπτειν]** to wear out (pass., from fatigue in the flesh and whole bodies) 2.17
- συμβαίνειν]** to happen 2.18; 4.34; 5.43; 12.93; 14.104; 16.127
- συμπάθεια]** sympathy (of the sinews and vessels in the thighs) 10.75–6
- συμφυής]** naturally one or united (comp., of the thigh compared to the calf) 10.72
- συνάρτησις]** connection (of the thighs with one another) 10.75
- συνεκφλεγμαίνειν]** to become inflamed (of the places around the chest) 12.93
- συνεργάζεσθαι]** contribute (to motion being continuous) 15.118
- συνεργεῖν]** contribute (to the nocturnal emission) 16.126
- συνέχεια]** continuity (of the bodily parts) 18.145

- συνεχής]** continuous (comp., of the thigh compared to the calf) 10.71; (of great movment) 15.115; (of movement on level ground) 15.118
- συντήκειν]** to cause colliquescence; <τὸ> **συντετηγμένον]** that which has undergone colliquescence 6.49
- σύνηγμα]** colliquescence 6.51
- σύνηξις]** colliquescence 1.3–4, 1.7, 3.18, 4.26, 4.28, 5.31, 6.38, 16.99
- συντονία]** tension (created in running, walking, lung down, and sitting) 7.56
- σφοδρός]** intense (comp., of stress from pressure from convex surfaces) 9.67
- σχῆμα]** position (to be in the same position creates fatigue) 3.28; 14.105; 14.108; (similarity of body position in walking on level ground) 15.117; (sleeping on one's back) 16.126
- σῶμα]** body (becomes fatigued) 2.11; 2.17; (does not take charge, i.e., fails to concoct food) 4.31–2; (becoming dried out) 5.36–7; (not always fatigued by becoming moist and weighed down) 5.42; (lifting up in walking causes stress) 11.80; (falling and thrusting forward unnaturally in going downhill causes stress) 12.86; (lifted up by the thigh in going downhill) 12.89; (pl., warm and moist because of colliquescence) 16.124; (pl., moist) 18.139; 18.146
- ταχύς]** swift (neut. as adv., of inflammation) 12.93; (comp. neut. as adv., of fever dying down) 12.95; (of a runner) 13.101; (of walking) 14.107; (comp. adj., of a walk) 14.108
- τόπος]** place (many) 6.49; (weight collected in) 9.67; (where residue is contained) 10.73; region (of the lungs) 12.92
- τροπή]** turning (of the body) 8.64
- τροφή]** food (equal amount less digested when sleeping on one's back) 16.127; nourishment (mixed with residue) 16.128; (much) 16.130; (digestion prevented by being mixed with residue) 16.131
- τύπτειν]** to pound (on account of the moist things of bodies) 18.146; (pass.) 18.147
- ὕγραίνεν]** to moisten (pass., of the body) 5.42
- ὕγρός]** moist (used substantively of the greater amount which results in sleep) 16.132; (twice; of bodies) 18.139; (of the nature of some elastic things) 18.143; (pl., cause pounding in the body) 18.146
- ὕγροτης]** moisture (sinew not receptive of) 1.6; (flows in) 3.25; (abundance causes repletion, sleepless, and catarrh) 4.31; (colliquescence) 4.33; (none present anywhere yet there is still fatigue) 5.37; (influx of) 5.39; (the affection [of fatigue] consists in) 6.46
- ὕδρωπιᾶν]** to have dropsy 5.40
- ὑπάρχειν]** to be present (no moisture) 5.37; (colliquescence) 5.39

ὑπεῖκειν] to yield (of surfaces which no longer yield once they take a weight)

7.59; τὸ ὑπεῖκον] that which yields (of a surface) 7.58

ὑπερβάλλειν] to be excessive (of moisture) 10.74

ὑπερβολή] excess (of colliquescence) 1.3

ὑπνος] sleep (plural; of excessive sleep) 4.34, 16.128, 16.131

ὑποκείμενον] to lie beneath; τὸ ὑποκείμενον] that which lies beneath (of surfaces which are compressible by nature and possess “give”) 8.62

ὑπολαμβάνειν] to suppose (Epigenes on the seats of fatigue) 1.2

ὑπτίος] on one’s back (of a sleeping position) 16.125

φέρειν] to carry (pass., of heavy things) 12.90

φλεγμονή] fever 12.94

φλέψ] blood vessel 1.3, 10.76

φόρτιον] burden (of the body in going uphill) 11.80

φρίκη] shivering (in winter) 17.135

φύσις] nature 1.7; 8.61; 12.86; 18.143

χαλεπός] difficult (to define) 6.44; (comp., going uphill than down) 12.90; dangerous (comp., of the places around the chest than those below) 12.91; (inflammation from the legs is not) 12.94; difficult (being in the same position) 14.105

χρή] it is necessary, must (of yielding surfaces pressing back) 7.59

χειμερινός] in winter (treatment of fatigue) 17.133

χεῖρ] hand (weight in for support) 13.98; (provide support to the runner) 13.100

χρόνος] time (a longer period) 8.62; (equal amount) 14.108

χωρίον] ground (level) 14.106

ῥῆμος] shoulder (stress because of carrying a weight) 11.84

ῥμότης] crudeness (of undigested or unconcocted food) 4.34

ῥρα] season (of the year) 17.136, 17.138

ῥσπερ] just as (in the use of hard beds) 2.20; (in immoderate sleeping) 4.34; (in those with dropsy and sitting in chairs) 5.40; (the foot which has breadth) 11.83; (the competitor in the pentathlon has support on the jumping weights) 13.99

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WILLIAM W. FORTENBAUGH
is Professor emeritus of Classics at
Rutgers University. His numerous
publications on Peripatetic topics
include *Artistotle on Emotion* (1975) and
Quellen zur Ethik Theophrasts (1984).

He is the founder of the Project
Theophrastus.

ROBERT W. SHARPLES
is Professor of Classics at University
College London. He has published
commentaries on works by Plato, Cicero,
Alexander of Aphrodisias and Boethius.
He has also published commentaries
on Theophrastean biology (1995) and
physics (1998).

MICHAEL G. SOLLENBERGER
is Professor of Foreign Languages at
Mount St. Mary's College, Maryland.
He has published on the Peripatetic
Lives of Diogenes Laertius and was the
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